

---

is acceptable. Tribal/DOE Program Director and the DOE Program Manager shall be consulted regarding any agreement or significant communication between DOE and Tribal personnel, unless otherwise provided in this Agreement.

Any necessary or desired contact between Tribal personnel and DOE contractor personnel and facilities will generally be arranged through DOE. In some cases, where lines of communication have been established between the Tribes and contractor governmental relations or technical personnel, direct contact is acceptable, provided no additional costs result.

To enter the INEEL or any DOE or INEEL contractor controlled facilities, Tribal personnel must comply with DOE badging and security requirements as arranged through the DOE Program Manager. Entry to some facilities or portions of facilities may be precluded because of safety or security requirements. Entry to certain areas may require specific safety training. DOE or its contractors will provide any specific safety training required for entry.

### 13. CONTROLLED DOCUMENTS

None of various provisions of this Agreement shall be construed as providing for the release of reports or other information designated as "Classified" or "Unclassified Controlled Nuclear Information" (UCNI) to the Tribes, or waiving any other security requirements. Classified information includes National Security Information (10 CFR Part 1045) and Restricted Data (10 CFR Part 1016). Unclassified Controlled Nuclear Information is described in 10 CFR Ch. X, Part 1017. In the event that information requested under the provisions of this Agreement is determined by DOE to be exempt from disclosure under the Freedom of Information Act, providing the information is not Classified or UCNI, is not controlled by the Privacy Act, and does not contain proprietary information or intellectual property information, DOE may, to the extent authorized by law, provide such information to the Tribes upon receipt of the Tribes' written assurance that the Tribes will maintain the confidentiality of such information.

### 14. RESOURCES

DOE will provide financial assistance to the Tribes for the purpose of carrying out the provisions of this Agreement, provided the U.S. Office of Management and Budget and Congress approve funding requests. The financial assistance will be provided through Cooperative Agreement DE-FC07-03ID14443 (or succeeding agreements) consistent with DOE financial assistance rules set forth in 10 CFR Subchapter H, Part 600. The Tribes' obligations to perform under this Agreement are contingent upon adequate funding by DOE. All funds provided to the Tribes are Federal funds to be administered exclusively by the Tribes consistent with the provisions of the Cooperative Agreement. No provision herein shall be interpreted to require obligation or payment of funds in violation of the Antideficiency Act, 31 U.S.C. Sec. 1341.

### 15. AMENDMENTS AND TERMINATION

This Agreement shall continue in effect from the date of execution for a five (5) year term, and may be modified as mutually agreed. This Agreement shall only be amended or terminated by the written mutual agreement of both parties; provided, however, that DOE funding obligations

under this Agreement may be suspended or terminated by DOE, in whole or in part, if DOE determines in accordance with applicable laws and regulations that the Tribes are not in compliance with the terms and conditions of the Cooperative Agreement or in the event that appropriations are not available.

FOR THE SHOSHONE-BANNOCK  
TRIBES:

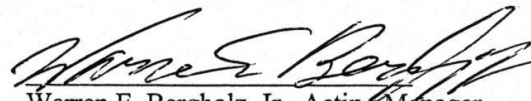
Signed:

  
Blaine Edne, Chairman  
Fort Hall Business Council

Date: 12-10-02

FOR THE U.S. DEPARTMENT OF  
ENERGY:

Signed:

  
Warren E. Bergholz, Jr., Acting Manager  
Idaho Operations Office

Date: 12/10/2002



Terms Defined

1. Aboriginal Territory – Those lands or areas historically and traditionally occupied, frequented or used by a specific group or Tribe to live or subsist.
2. Ceded Lands – Lands, which are granted, relinquished, assigned, transferred, typically by Treaty. Ceded territories are those lands formerly occupied by Indians that were relinquished to the U.S. government during the Treaty process.
3. Consult (Consultation) – Consultation includes, but is not limited to, prior to taking any action with potential impact upon American Indian and Alaska Native nations, providing for mutually agreed protocols for timely communication, coordination, cooperation, and collaboration to determine the impact on traditional and cultural life ways, natural resources, treaty and other federally reserved rights involving appropriate Tribal officials and representatives throughout the decision-making process, including final decision-making and action implementation as allowed by law, consistent with a government-to-government relationship. For purposes of this Agreement, the consultation process includes: 1) notifications and discussions at a working level; 2) technical briefings and discussions to mitigate impacts and effects; and 3) where required or necessary to resolve disputes, formal government-to-government consultation between the Tribal Council and the DOE-Idaho Operations Office Manager.
4. Cultural Resources – For the purposes of this Agreement cultural resources include, but are not limited to: archaeological materials (artifacts) and sites dating to the prehistoric, historic, and ethno historic periods that are located on the ground surface or are buried beneath it, natural resources, sacred objects, and sacred sites that have importance for American Indian and Alaska Native peoples; resources that the American Indian and Alaska Native nations regard as supportive to their cultural and traditional life ways.
5. Historic Properties or Historic Resources – Any prehistoric or historic district, site, building, structure, or objects included in, or eligible for inclusion on the National Register, including artifacts, records, and material remains related to such a property or resource. 16 U.S.C. § 470w(5).
6. Government-to-Government – This relationship acknowledges Tribal governments as sovereign entities with primary authority for the protection of the health, safety, and welfare of their citizens. Status as a sovereign nation requires the federal government to interact with tribal governments on an official basis, one government to another. Government-to-government also recognizes a Tribe's right to self-government and self-determination.
7. Reservation Lands – Reservations are established by treaty and specifically sets aside a geographic area for exclusive occupation by a Tribe or Band of Indian people.

- 
8. Trust (Responsibility) – Trust Responsibility includes, but is not limited to: promotion and protection of Tribal Treaty rights, federally recognized interests of the beneficiary American Indian and Alaska Native nations; determining, documenting, notifying, and interacting with tribal governments with regard to the impact of Departmental programs, policies, and regulations to protect American Indian and Alaska Native traditional and cultural life ways, natural resources, treaty and other federally recognized and reserved rights.
  9. Withdrawal – Withdrawal means withholding an area of Federal land from settlement, sale, location, or entry under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or over an area of Federal land from one department, bureau or agency to another department, bureau or agency. (41 CFR, Section 2300.0-5)

---

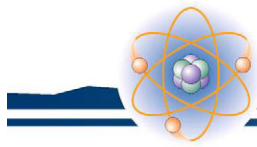


## **Attachment 3**

### **Communications Protocol**

---

---



## Communications Protocol August 10, 1999

### Communications Protocol for Undertakings Involving An American Cultural Resources on the INEEL

The Department of Energy, Idaho Operations Office (DOE-ID) recognizes and appreciates the need to interact and consult directly with the Shoshone-Bannock Tribes, as well as other tribes, regarding the management of the cultural resources at INL. General provisions for consulting with the Tribes are provided for in the Agreement-In-Principle between DOE-ID and the Tribes, and consultation is required under the American Indian Graves Protection and Repatriation Act (NAGPRA), the National Historic Preservation Act as amended in 1999, Executive Order 13007 and the ensuing DOE American Indian and Alaska Native Tribal Government Policy. To accomplish effective and timely consultation in accordance with the applicable laws involving such consultation, and to enhance the informal interaction needed to serve the needs of the agency, contractor and tribal entities who have a stake in the issues, cultural resource interaction and consultation on the undertakings involving American Indian cultural resources at INL will be conducted in the manner presented here.

These procedures do not supersede or replace any other provisions for consultation with the Tribes or other regulatory agencies under applicable federal or state laws. Rather, they are intended to supplement them and to provide clarification on how and when interaction and consultation between DOE-ID and the Tribes regarding cultural resources at INL will occur. To the extent these procedures are inconsistent with any applicable Federal or state laws, the applicable laws will control.

#### A. Definitions

For the purposes of these procedures, the following definitions are provided.

**“Cultural resources”:** “Cultural resources” is a broad term, used generally throughout these procedures, which includes the following:

- A. *Historic properties* as that term is defined in the NHPA [36 CFR 800.2(e)], which includes prehistoric and historic sites, districts, structures or objects, with emphasis on those associated with American Indian origin or culture;
- B. *Cultural items* as that term is defined in the NAGPRA [43 CFR 10.2(d)], which includes human remains, associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony;
- C. *Sacred sites* as that term is defined in Executive Order 13007 [Section 1(b)(iii)], which means any specific, discrete, narrowly delineated location of federal land (specifically for the purposes of these procedures, INL) that is identified by an American Indian tribe, or by an American Indian individual determined by the Tribes to be an appropriately authoritative representative of an American Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an American Indian religion; provided that the Tribe or appropriately authoritative representative of an American Indian religion has informed the agency of the existence of such a site;



- 
- D. *Traditional cultural* properties as that concept is discussed in National Register Bulletin #38, published by the National Park Service.

**“Consultation”:** This term is used in these procedures to indicate a formal conduct of meaningful dialogue between the Tribal Council and the DOE-ID manager or their duly authorized designees with decision-making authority, which is intended to result in a mutually acceptable agreement on the resolution or disposition of an issue related to cultural resources at INL.

**“Interaction”:** This term describes the informal, casual, day-to-day working relationship between the tribal, federal and contractor technical cultural resources management (CRM) personnel, which is intended to maximize the effectiveness of their working relationships and minimize the administrative barriers to successful, timely and effective management of cultural resources at INL.

**“Undertaking(s)”:** This term is used as defined in the NHPA and its implementing regulations [36 CFR ‘800.2(o)].

**“Effect” and “Adverse Effect”:** These terms are used as defined in the NHPA and its implementing regulations [36 CFR ‘800.9]

## **B. Interaction and Consultation**

Differing levels of activity involving cultural resources at INL require a flexible approach to consultation. For this purpose, three levels of interaction and consultation have been developed, and differ by degree of formality and personnel involved. Technical personnel involved in interaction and consultation should work to avoid the use of a more formal level than is required, in order to make the most effective use of time and resources and to minimize the administrative burden on personnel. However, personnel should use discretion in determining the appropriate level of consultation, and consideration should be given for the need to present an adequately documented record of consultation in the event of disputes. The appropriate level of interaction or consultation to be implemented will be decided by consensus among the tribal, federal and contractor Cultural Resource Management (CRM) technical personnel unless otherwise dictated by law.

### **Level I: Routine Technical Communication.**

This informal level most often involves the direct interaction of DOE-ID or contractor CRM personnel in the INL Cultural Resources Management Office (INL CRMO) with tribal CRM personnel, or between a subcontractor or other researcher/user personnel and DOE-ID or INL CRMO personnel. Routine interaction would usually occur on a daily or weekly basis as needed, and involves telephone calls, electronic mail messages, working meetings, etc. Another mechanism for routine technical interaction is the periodic meeting of the INL Cultural Resources Working Group (CRWG), consisting of tribal, federal and contractor CRM technical personnel, to discuss issues, activities, project status, or other cultural resource areas of interest.

Two types of formal notification are involved in routine interaction: quarterly summaries of routine, non-impacting undertakings; and notifications of undertakings which occur in previously undisturbed or unsurveyed areas, including caves.

1. *Quarterly Summaries of Routine Non-Impacting Undertakings:* At the end of every quarter of the federal fiscal year, the INL CRMO will prepare a summary of undertakings at INL that require CRM clearance recommendations or surveys, and which did not affect (as defined in the NHPA) an American Indian cultural resource. This summary will be sent directly to the designated tribal

---

CRM personnel, and to DOE-ID if requested by the DOE-ID cultural resources coordinator. tribal CRM personnel may request additional information about the clearances or surveys related to any of the undertakings listed. This request should be made directly by tribal CRM personnel to the INL CRMO, and the tribal CRM office should provide a courtesy copy of the request to the DOE-ID cultural resources coordinator.

2. *Notification of Undertakings in previously Undisturbed/Unsurveyed Areas:* If an undertaking is to take place in an area of INL that has not been previously disturbed in any way, or has not yet undergone any degree of archaeological survey, the INL CRMO will notify the tribal CRM personnel of the undertaking and the location, upon a determination to begin any activity pursuant to the undertaking. The intent of this notification is to allow the Tribes the opportunity to comment on or become otherwise involved in the undertaking at the earliest possible time. The tribal CRM personnel are encouraged to use this opportunity to provide information regarding cultural resources which may assist in the planning or implementation of the work being performed.

This notification may be made by telephone call, faxed message, electronic mail (e-mail) or other informal mechanism. The INL CRMO should have additional information, such as maps, project descriptions, etc., ready to provide to the tribal CRM personnel upon request. As provided in the Agreement-In-Principle, tribal representatives are permitted to inspect, review or be present at and during any archaeological excavation or survey of interest at INL provided adherence to all security, safety and environmental requirements is met.

DOE-ID recognizes and supports the need for the Tribes to keep certain sensitive or sacred information from being released to non-tribal members, and does not desire to compromise this need. DOE-ID, contractor personnel and the Tribes should work to communicate the need to avoid certain areas in a sensitive and respectful manner, which also allows project planners to proceed with their planning in a timely manner.

## **Level II: Intermediate Interaction.**

The second level of interaction is actually a formal consultation between the technical CRM personnel for DOE-ID, the Tribes and the INL CRMO, acting as the designees of their respective agencies. This level is entered into when it is determined (either through Level I interaction or other means) that an undertaking has the potential to affect an American Indian cultural resource. This level is also the level at which formal notification of the State Historic Preservation Office (SHPO) is made for the purposes of conducting a NHPA Section 106 review of undertaking.

1. *Notifications of Undertakings:* The notification method will be an immediate telephone call to the tribal CRM office by either DOE-ID CRM or the INL CRMO as soon as possible when either the INL CRMO or DOE-ID determines that an undertaking may have an effect upon an American Indian cultural resource. A formal letter of notification should be sent from the DOE-ID CRM to the tribal CRM office within 10 working days of the notification call, and to the SHPO if the cultural resource affected is a historic property. This letter should include a request for further consultation. INL CRMO should also notify the appropriate contractor management authority, to ensure that their management is aware of the potential effect and the potential need for mitigation measures. If the notification to the SHPO is made for an undertaking involving a historic, but non-American Indian, resource (i.e., a built historic property), the tribal CRM office need not be notified.
2. *Emergency Notifications.* In the event that an appropriate INL authority declares a site emergency in response to a natural disaster or other threat to the environment, facility, the public or personnel,

---

the notifications will be conducted in accordance with the INL Emergency Management Plan/RCRA Contingency Plan. Follow-up interaction of CRM personnel to determine if the emergency or emergency response had any effect on American Indian cultural resources or to determine how to mitigate any adverse effects of the emergency or emergency response on those resources will be conducted at Level II as soon as possible following cessation of the emergency status. The DOE-ID cultural resources coordinator should send any formal notification or other documentation to the tribal CRM personnel within 10 working days of the declaration of the emergency.

3. *Inadvertent Discoveries:* In the event that an inadvertent discovery of a cultural resource involves human remains or American Indian cultural items as defined in NAGPRA, all parties should initiate Level III consultation, and then proceed as mandated in NAGPRA and its implementing regulations at 43 CFR 10, or as provided in any agreement entered into between DOE-ID and the Tribes pursuant to 43 CFR 10.5(f).

### **Level III: Government-to-Government Consultation.**

This is the most formal level of consultation, and involves communication between the tribal chairperson and the DOE-ID manager. Such consultation will be utilized when the INL CRMO, in consultation with appropriate parties (including DOE-ID, the tribal cultural resource personnel, the SHPO, and project managers), determines that an undertaking will have an *adverse* effect upon an American Indian resource, and mitigation needs to be performed, or when American Indian human remains or other cultural items as defined by NAGPRA are inadvertently discovered.

1. *Notification of Tribes:* In either situation, Government-to-Government consultation shall be initiated with a formal letter of notification from the DOE-ID manager to the tribal chairperson within 10 working days of the determination of the adverse effect, or within the time limits mandated by NAGPRA in the case of an inadvertent discovery of human remains or cultural items. The letter should include a request for technical consultation on mitigation of the adverse effect or on the disposition of the remains or cultural items. In the case of human remains, the letter must include other information as required by NAGPRA's implementing regulations [43 CFR 10.4(d)].
2. *Notification of SHPO and others:* The DOE-ID cultural resources coordinator should also provide notification to the SHPO or the State Archaeologist, as appropriate and per the requirements of NHPA Section 106. Courtesy copies of all notifications should be provided to the distribution list given at the end of these procedures.
3. *Meetings:* If the Tribes desire any personal meetings or presentations about the undertaking, the effect, the remains or the resource, DOE-ID and INL CRMO and their respective project managers should coordinate to prepare and deliver the information in a manner and location requested by the Tribes.
4. *Technical Mitigation:* Once the initial letter of notification and request for consultation has been sent to the tribal chairperson, the respective CRM technical personnel should implement lower levels of consultation or interaction to work out the details of mitigation or disposition, at the discretion of the tribal chairperson and the DOE-ID manager. The cultural resource technical personnel will define the project history, recommend mitigation or disposition alternatives, coordinate with any project or program managers whose projects may be effected by the disposition or mitigation, assist in preparing formal correspondence, provide assistance to the

---

Government and Council officials, and assist in the project mitigation or disposition as deemed necessary by the Government and Council officials.

5. *Letter of Proposed Disposition or Resolution*: A final letter documenting the agreed-upon course of resolution and any implementation plan developed should be sent from the DOE-ID Operations manager to the tribal chairperson, and should include a courtesy copy to INL CRMO and any appropriate contractor and DOE-ID managers. In the case of an inadvertent discovery of human remains or cultural items, per NAGPRA, DOE-ID will proceed with the specified requirements in NAGPRA's regulations at 43 CFR '10.4 et al.

#### **C. Conflict Resolution**

If resolution or consensus cannot be reached after reasonable effort and discussion on the part of the respective tribal, federal and contractor CRM technical personnel, the next highest level of consultation will automatically be implemented. If resolution or consensus cannot be achieved at Level III, a professional mediator, amenable to all parties, shall be invited to participate in the decision making process.

#### **D. Revision of Procedures**

These procedures may need to be periodically revised or updated to reflect changes in law, agreement, organization or other factors. Such revision should be accomplished after DOE-ID, INL CRMO and tribal cultural resource personnel agree on the need for changes to these procedures, and should be done in a mutually agreeable manner. DOE-ID will take the lead on preparing the revisions, and distributing drafts to the tribal and INL CRMO cultural resource personnel. Proposed revisions should be reviewed by all appropriate and affected federal agency, contractor and tribal personnel, including but not limited to project managers, legal advisors, technical personnel, and regulatory personnel. DOE-ID, INL CRMO and tribal cultural resource personnel should consider any comments or suggestions received by reviewers, and incorporate consensually agreed upon changes where appropriate.

---

## Communications Protocol June 8, 1999

### Correspondence List

Courtesy copies of relevant correspondence, including letters of notification prepared during Level II or Level III consultation, should be provided to the following list of personnel:

#### DOE-ID

Environmental Programs manager, tribal liaison officer, cultural resources coordinator  
Project manager  
Office of Chief Counsel  
INL Cultural Resource Management Office  
Project manager  
Regulatory Affairs manager and other senior level managers (in case of Level III consultation)

#### Tribal

Tribal attorney  
Tribal Business Council (in case of Level III consultation)  
Tribal cultural resources coordinator

#### Other (depending on situation and level of consultation)

Idaho State Historic Preservation Office

This distribution list should be kept current, and revised as personnel and titles change. The respective CRM personnel are responsible for notifying the INEEL CRMO of changes as soon as possible. Revisions to the list should be prepared by the INEEL CRMO, and provided to DOE-ID and tribal CRM personnel as soon as possible.





## **Attachment 4**

### **Memorandum of Agreement Between United States Department of Energy, Idaho Operations Office and the Shoshone-Bannock Tribes**





## MEMORANDUM OF AGREEMENT BETWEEN

UNITED STATES DEPARTMENT OF ENERGY  
IDAHO OPERATIONS OFFICE

and the

SHOSHONE-BANNOCK TRIBES

### I. INTRODUCTION AND PURPOSE

The United States Department of Energy (DOE), a federal executive agency, through its Idaho Operations Office (DOE-ID), owns and operates the Idaho National Engineering Laboratory (INEL), an approximately nine hundred square mile nuclear facility site in southeastern Idaho. Under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, and the Department of Energy Organization Act, functions performed at the INEL include research and development in nuclear and other energy areas, and projects and programs related to environmental restoration and waste management.

The Shoshone-Bannock Tribes ("Tribes") are a federally-recognized Indian tribe. The Fort Bridger Treaty of July 3, 1868, 15 Stat. 673, secured the Fort Hall Reservation as the permanent homeland of the Shoshone-Bannock peoples. The aboriginal rights reserved by the 1868 Treaty extend to areas of land in Idaho and surrounding states, and the Treaty reserved for Tribal members hunting, fishing, and gathering rights on surrounding unoccupied lands of the United States. While the parties acknowledge that the INEL Site is occupied land, it is recognized that certain areas on the INEL Site have cultural and religious significance to the Tribes. The INEL is located within the aboriginal territory of the Shoshone-Bannock Tribes.

DOE Order 1230.2, and DOE's American Indian Policy of November, 1991, establish DOE's commitment to assure that tribal rights and concerns are considered, and to avoid unnecessary interference with traditional religious practices. This policy also provides for access to sacred areas and traditional resources located on DOE lands in accordance with safety, health, and national security considerations.

In order to preserve and protect the cultural and religious interests of the Tribes, DOE and the Tribes are entering into this Memorandum of Agreement ("MOA") to provide the Tribes access to the Middle Butte area, and other INEL areas that may be identified for access in the future, for the performance of Tribal sacred or religious ceremonies, or other cultural or educational activities. The Middle Butte area is defined generally as that area within the boundaries of the INEL, directly south of Highway 20 and east of Highway 26, legally described as Sections 15, 16, 17, 20, 21, and 22 of T 2 N, R 32 E, Bingham County, Idaho. A map of the area is attached hereto and incorporated herein to this MOA.

---

## II. LEGAL AUTHORITY

Legal authority for this MOA is as follows:

A. The Department of Energy Organization Act, 42 U. S. C. Section 7101 et seq., which envisions consultation, coordination, and cooperation with Federal departments and agencies to assure coordinated and effective administration of Federal energy policy and programs. The Act also establishes the statutory responsibility to ensure incorporation of national environmental protection goals of restoring, protecting, and enhancing environmental quality, and assuring public health and safety.

B. DOE Order 1280.1A delegates authority to the Manager of DOE-ID to enter into Memoranda of Understanding.

C. The Tribes as a sovereign government are obligated to protect both the individual and communal interests of the Tribes pursuant to the 1868 Treaty. The Fort Hall Business Council, governing body of the Tribes, has authority under the Tribes' Constitution and Bylaws to enter into agreements.

## III. SCOPE

This MOA addresses access by the Tribes to the Middle Butte area and other INEL areas that may be identified for access in the future, in a manner which assures that safety, security, and cultural resource protection concerns are met.

## IV. GUIDELINES

DOE-ID and the Shoshone-Bannock Tribes understand that the following guidelines will apply to activities conducted by the Tribes at the INEL:

A. DOE shall provide access to the Middle Butte area for the Shoshone-Bannock Tribes. Such access shall be for the purposes of allowing Tribal members to perform sacred or religious ceremonies or other educational or cultural activities in the Middle Butte area.

B. The Tribes shall notify Protective Technologies Idaho (PTI) Security Headquarters at least 24 hours prior to entry onto the INEL, and shall provide them with the name of the Tribal member who will be responsible for the group, an approximate number of people who will be at the Middle Butte area, and an estimated time of their arrival and departure from the INEL.



---

C. DOE shall provide a briefing to the Tribes within 30 days of the signing of this MOA. The briefing will address concerns with unexploded ordnance which exists on the INEL. This briefing may be periodically updated, as necessary. To ensure the members' continued safety, the Tribes agree to apprise all members who may seek access to the Middle Butte area of the potential risks from unexploded ordnance. DOE has not confirmed through ground survey that no unexploded ordnance is in the access area. The access area is as close as two miles from the perimeter of areas known to be used for ordnance testing. The Tribes recognize and assume the risk of the potential for unexploded ordnance and take responsibility for the safety of its people while in the Middle Butte area. The Tribes agree to notify DOE of the location of any ordnance discovered.

D. DOE and the Tribes recognize that there are certain cultural and archaeological resources located on the INEL, and that such resources should be protected from damage, alteration, removal or destruction. Both parties agree to avoid any damage, alteration, removal or destruction of such cultural or archaeological resources, or any other resources which may be encountered at the INEL, and to conduct activities consistent with other applicable requirements, including the National Historic Preservation Act, the Archaeological Resources Protection Act, Native American Grave and Repatriation Act, and any other act preserving cultural resources. Ceremonial offerings shall be permitted but must be reported to the Tribal Cultural Resource Department and made a part of the Middle Butte area record. Motorized vehicle access shall be limited to existing roadways.

E. This MOA shall not confer any rights upon members of the Tribes for purposes of hunting or fishing on the INEL other than what is reserved by treaty, nor shall it confer any property interest (e.g., an easement or license) to the Tribes.

## **V. FUNDING**

This MOA does not in and of itself obligate any funds of the United States.

## **VI. WORKING AGREEMENT**

The DOE-ID and the Tribes agree that this MOA is not and will not be interpreted as being inconsistent or in violation of any provision of the Working Agreement entered into on September 29, 1992.

## **VII. AMENDMENT**

This Memorandum of Agreement may be modified or amended by written agreement between DOE and the Shoshone-Bannock Tribes.



# VIII. EFFECTIVE DATE

This Memorandum of Agreement is effective when signed by both parties, and shall continue in effect until mutually terminated by both parties, or upon 30 days' written notice by either party.

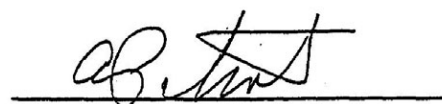
Fort Hall Business Council for  
the Shoshone-Bannock Tribes



Keith Tinno, Chairman

Date Jan 26, 1994

U. S. Department of Energy  
Idaho Operations Office



Augustine A. Pitrolo, Manager

Date 1/26/94





## **Appendix C**

### **Standards and Procedures for the Management of INL Archaeological Properties**





## **Appendix C**

# **Standards and Procedures for the Management of INL Archaeological Properties**

## **INTRODUCTION**

This section describes the general professional and program standards for archaeological investigations at INL. Examples of documents that support performance of archaeological investigations at INL, referred to as figures, are presented at the end of the appendix.

The INL CRM Office conducts cultural resource advisory, compliance and research activities for DOE-ID and manages and coordinates all cultural resource investigations, including oversight of subcontractors and outside researchers in archaeology, history, and paleontology. Similar standards and procedures for the management of INL historic architectural resources are provided in Appendix D.

Standards and guidelines have been issued by the Idaho SHPO through the Idaho Archaeological Survey, Idaho Advisory Council of Professional Archaeologists, national ACHP, and U.S. Department of Interior National Park Service (NPS). All cultural resource management work at INL is and will continue to be performed in a manner consistent with these authorities. This protocol will be reviewed annually and updated as necessary in response to changes in federal, state, and professional guidelines as well as internal and external feedback obtained from experience conducting cultural resource management and scientific activities at INL.

## **INL ARCHAEOLOGICAL RESOURCES**

INL contains a great number of archaeological sites from the prehistoric and historic time periods and even a variety of industrial archaeological sites from the very recent past. Because modern development within the 890-square-mile facility has been limited in expanse, many of these resources exhibit remarkable integrity. Since the early 1970s, DOE and its contractors have been committed to protecting INL archaeological resources from unmitigated harm during INL activities.

## **History of INL Archaeological Investigations**

Archaeological investigations at INL, initiated in the late 1950s, have passed through four successive stages. The first stage involved numerous visits to areas where prehistoric sites were known or expected to have occurred. These initial projects were directed by E. H. Swanson, Jr., of the Idaho Museum of Natural History, as part of a larger project to examine prehistoric sites in all of southeastern Idaho (Swanson 1972; Swanson and Bryan 1959; Swanson, Butler, and Bonnichsen 1964; Swanson, Tuohy, and Bryan 1959; Reed et al. 1987). Later, from 1967 to 1972, additional intuitive surveys were conducted on INL lands by individuals under the direction of B. R. Butler in an effort to discover the nature and distribution of archaeological resources in the desert region of the northern Snake River Plain (Butler 1968; Butler 1970; Butler 1978).

The early intuitive surveys directed by Swanson and Butler were important in establishing the archaeological research potential of the INL region, particularly in regard to its prehistoric resources. Many important archaeological sites within caves, atop buttes, and near the margin of Pleistocene Lake Terretion were recorded through their efforts. However, these early surveys stand in contrast to the later systematic inventory projects because the latter have shown that INL not only holds many large and complicated prehistoric sites, but also contains thousands of smaller resources that are equally important



---

in understanding prehistoric lifeways. They have also brought attention to INL's inventory of important archaeological resources from the historic period, particularly those related to Carey Land Act-sponsored agricultural pursuits.

Beginning in 1974, INL entered into the modern era of cultural resource management and the second stage in development of the current Cultural Resource Management Program. The cultural resource inventories conducted during the past 25 years are generally more intensive and systematic than previous work. This is largely due to the fact that most have been conducted with the specific goal of meeting regulatory requirements to identify and assess impacts to all cultural resources, rather than simply discovering the largest or oldest sites.

The first surveys of this modern era were supervised by S. J. Miller from 1974 to 1984 and included many small construction projects as well as several larger projects such as INL Perimeter and Grazing Boundaries, the Diversion Area, and the New Production Reactor Areas. Over 400 INL archaeological resources from early prehistoric through historic time periods were systematically recorded as a result of this work (Miller 1983; Miller 1984; Miller 1985; Reed et al. 1987).

Beginning in 1985, the INL Cultural Resource Management Program moved into a third stage of development with the initiation of a subcontract with the Idaho State University Department of Anthropology for large cultural resource inventory projects. R. N. Holmer directed most of these projects through an organization named variously as the Swanson/Crabtree Anthropological Research Lab, the Northern Intermountain Quaternary Institute, and the Center for Environmental Anthropology (see Ringe 1993 for a summary). The first projects involving archaeological test excavation at INL were also completed under this agreement (Wright 1988; Ringe 1988).

The Idaho State University surveys are important because they set a methodological precedent for all subsequent archaeological investigations at INL. The standardized methods employed during these projects are still in use today because they are of sufficient rigor to ensure that all cultural resources with visible surface remains are identified in all project areas. Many large INL survey projects were completed by the teams from Idaho State University from late 1984 through July of 1991, with 1,050 cultural resources recorded. It is also significant to note that subsurface testing was conducted at 64 prehistoric site locations during this period (Ringe 1988; Wright 1988; Ringe 1990; Henrikson and Holmer 1991; Thompson 1991; Sammons and Furniss 1992).

The fourth and most recent stage in the development of the INL Cultural Resource Management Program began in 1989 with the formation of the INL Cultural Resource Management Office to serve as a focal point for information flow and action regarding cultural resource compliance and research at INL. Since the creation of this team, most archaeological surveys at INL have been conducted in-house. Attention has been directed beyond basic compliance with Section 106 of the National Historic Preservation Act to the full spectrum of cultural resource issues, including public education and outreach, American Indian consultation, site monitoring, compliance with NHPA Section 110, and long-term stewardship (Miller et al. 1995).

As the INL Cultural Resource Management Program has matured, initial focus on archaeology has expanded to include an emphasis on archaeological sites, buildings, artifacts, and archives associated with more recent facility history. As a result of the unique nature of the work conducted at INL, many buildings and structures are considered to be historically significant (Arrowrock Group 1997). With increasing emphasis on environmental restoration, there has been a corresponding increase in cultural resource reviews of actions affecting these resources (see Appendix D).

In addition, stakeholder involvement became increasingly formalized in 1992 with the establishment of a working agreement between the Shoshone-Bannock Tribes and DOE-ID. This agreement was

---

superseded in 1998 by an agreement-in-principle that further defined the working relationship between the Tribes and DOE-ID while promoting increased interaction, understanding, and cooperation on issues of mutual concern such as protection of natural environment and cultural resources (see Appendix J). In the spirit of openness fostered by the agreement, and in recognition of the need to often facilitate communication from the ground up, the CRWG was established in 1992. Comprised of preservation professionals from the Shoshone-Bannock Tribes, DOE-ID and the INL CRM Office, the group strives to reduce potential conflicts in the sensitive relationship between steward and stakeholder. The CRWG addresses diverse issues such as, but not limited to, traditional cultural places, sacred sites, cultural landscapes, human remains, and a variety of other resources that fall under the purview of the Native American Graves Protection and Repatriation Act, NHPA, and ARPA.

## **Archaeological Resource Types**

Through the efforts of the aforementioned preservation professionals, approximately 6% of INL has been intensively surveyed ( $\leq 20$ -meter survey intervals) and another 2% of INL has been subjected to reconnaissance-level examination (50- to 100-meter survey intervals). Within the 34,014 acres that have been intensively examined and the 13,425 acres that have been less intensively examined are 2,073 identified archaeological resources. Approximately 95% of these resources are campsites, lithic scatters, and rock features from the prehistoric period (12,000 to 150 years ago). A preliminary predictive model suggests that there may be as many as 75,000 additional resources of these types as yet undiscovered within the boundaries of INL (Ringe 1995).

Also represented in the inventory of 2,073 known INL archaeological resources are localities that reflect more recent activities including homesteads, old canals and canal construction camps, emigrant trails, stage stops, and railroad sidings, as well as trash dumps and other features associated with U.S. government use of INL after 1942.

## **INL POLICIES FOR ARCHAEOLOGICAL RESOURCES**

DOE-ID and its contractors follow specific procedures to conduct research, environmental remediation, and operations at INL in a manner that protects human health and the environment in full compliance with environmental laws and regulations (see Appendix A). Cultural resources, including archaeological resources, are an expressed part of the protected environment. Protection is achieved through integration of environmental requirements into work planning and execution and consistent actions to minimize the environmental impacts of INL operations. This integrated approach applies to all INL employees and subcontractors who are also expected to report any environmental concerns to INL management. Management, in turn, is expected to take prompt action to address any concerns or issues.

The INL environmental policy is implemented through internal standards and procedures as summarized in Appendix A. Cultural resource protection is an integral element in these procedural documents and is accomplished through a tailored review process that directly involves the INL CRM Office.

## **The Cultural Resource Review Process**

INL is an active scientific and engineering laboratory. Thousands of work orders for projects ranging from lawn mowing to new facility construction are processed each year. Detailed procedures are in place to evaluate the environmental consequences of all activities, large or small.

---

INL CRM Office review of proposed projects is prompted whenever one of the following basic thresholds is met:

1. Ground disturbance outside the boundaries of fenced INL facility areas or more than 50 ft from existing buildings or landscaped areas in unfenced facility areas
2. Demolition, major structural or landscape modification, or permanent closure of extant buildings or structures (see Appendix D)
3. Any activities proposed for the EBR-I facility area, a National Historic Landmark (see Appendix D)
4. Any ground disturbance within or around CITRC, where sensitive cultural remains have been inadvertently discovered in disturbed and undisturbed contexts
5. Any activities proposed for known or suspected zones of American Indian sensitivity and/or high archaeological resource density.

Proposed INL projects that meet one or more of these criteria are screened by the INL CRM Office to determine if they will affect cultural resources. Various techniques are employed to make this determination, including archive and record searches, on-the-ground surveys, and consultation. (Basic guidelines for the conduct of these activities are provided in expanded discussions to follow and in Appendix D.) Archaeological reviews are not completed for projects that occur within highly disturbed areas inside fenced INL facilities (TAN, WRRTF, NRF, RTC, INTEC, RWMC, ANL-W) or within 50 ft of standing buildings or structures in unfenced INL facilities (CFA, ARA, BORAX). EBR-I and CITRC are exceptions to this general rule because they each contain resources of special concern (National Historic Landmark at EBR-I and American Indian human remains at CITRC). Emergency activities are also exempt from cultural resource review.

In general, all cultural resource reviews for archaeological resources begin with an exchange of information between the INL project manager and the INL CRM Office with the purpose of identifying an area of potential effect for the proposed project. Once this area is defined and the proposed activities within it are clearly understood, the INL CRM Office conducts an archive and literature review to determine the extent and results of any previous archaeological investigations within the project's area of potential effect.

The archive and literature search is designed to evaluate previous efforts to identify cultural resources within the area of potential effect for the proposed project and assess the need for additional archaeological survey, data recovery, and/or consultation. Areas of potential effect for projects proposed outside the boundaries of defined INL facility areas will always be intensively surveyed for archaeological resources before any work begins. In some instances, previously surveyed areas will be reexamined. This may occur if the previous survey was originally conducted more than 10 years ago or is judged to be of less rigor than current requirements call for, if conditions have changed markedly since the original survey was conducted (e.g., range fire), or if the proposed project is located in a highly sensitive area (e.g., CITRC and the Big Lost River). Other situations may call for intensive new surveys of proposed project areas and still others a mix of on-the-ground survey and stakeholder consultation.

Once all archaeological resources are identified within a project's area of potential effect, the INL CRM Office will determine if the proposed project will cause any impacts to the resources through a combination of archive and literature reviews, archaeological survey, and consultation. Three scenarios are possible for archaeological resources at this point in the cultural resources review process:

1. No cultural resources are present within the area of potential effect for the proposed undertaking, or cultural resources are present in the area but the proposed undertaking will have no effect on them

---

because they are included in the official list of exempt resources or they can be avoided by all project activities.

2. Cultural resources that are potentially eligible for listing on the National Register are present within the area of potential effect and the proposed undertaking will impact them, but the effect will not be adverse.
3. Cultural resources are present within the area of potential effect and the proposed undertaking will adversely impact them.

When no archaeological resources have been identified in the project area, the INL CRM Office completes documentation of the identification efforts and a justification of the finding of no effect for inclusion in the INL cultural resource management archives (see Figure 28). These findings are also summarized and included in INL CRM Office quarterly and yearly activity reports. After documentation is complete, the INL CRM Office provides written notification to the INL project manager with a recommendation that the project can proceed. Clearance recommendations such as this always carry a standard stipulation for stopping work if cultural materials (e.g., bones, obsidian flakes, "arrowheads" or other stone tools, darkened soil horizons, rusty cans, and ceramics) are unexpectedly encountered at any time.

A similar set of procedures is followed when identification efforts reveal archaeological properties that are not eligible for the National Register within the area of potential effect for the project. This includes any of the following types of archaeological resources:

- Isolated finds
- Archaeological resources that have been previously determined through consultation with the Idaho SHPO, Shoshone-Bannock Tribes, and other stakeholders and interested parties to be ineligible for nomination to the National Register or of no significance to the specified cultural group.

Since the potential for these types of archaeological resources to yield additional information is very low, as determined by the original identification effort or some other type of previous archaeological investigation; and since the setting has no bearing on the significance of those resources, and they are not deemed important by the appropriate tribal or stakeholder parties, they are considered to be ineligible for nomination to the National Register. Therefore, INL project activities will not significantly affect them, and they need not be avoided by project activities. Once documentation of the identification efforts and a justification of the no effect finding are complete and permanently filed (see Figure 28), the INL CRM Office can recommend clearance for these projects through written correspondence with the INL project manager. Reminders of the INL Stop Work Authority and its applicability to unexpected discoveries of cultural material are also included with each of these clearance recommendations.

Whenever possible, the INL CRM Office will endeavor to avoid impacts to all archaeological resources as a result of INL activities. This is particularly true when identification efforts (i.e. new survey, evaluation of resources recorded during a previous survey, and consultation) within a project's area of potential effect reveal archaeological resources that may be eligible for nomination to the National Register or significant to a local cultural group. The INL CRM Office takes a very conservative approach to significance evaluations in these, and all, situations. All archaeological sites are considered to be potentially significant until test excavations and/or consultation have been completed to assess their potential for yielding information of value in understanding research questions in history or prehistory (See Appendix E) and/or their importance to local cultural groups. Techniques employed to avoid damage to resources evaluated as potentially significant include, but are not necessarily limited to:

- Physical relocation of project activities

- 
- Establishment of minimal buffer zones (30 to 50 meters), depending on the situation, between the archaeological resource and the project activities
  - Placement of fences or other permanent markers around the perimeters of archaeological resources to physically prevent unauthorized access or disturbance
  - Placement of signs in the project area advising that destruction, alteration, or collection of historic and prehistoric archaeological materials is a federal crime
  - Placement of protective fill or other coverings over the surface of archaeological resources to act as a physical buffer between the sensitive materials and the project activities
  - Requirements for all project personnel to successfully complete cultural resource awareness training and specific project briefings provided through the INL CRM Office
  - Requirements for ongoing and intensive monitoring of project activities by the INL CRM Office to ensure compliance with agreed upon avoidance tactics.

When the setting is an important element in the significance of an archaeological resource, other techniques may be employed to effectively remove the resource from the area of potential effect for the project. Project relocation or physical limitations, restrictions on the timing of project activities, vegetative or landscape screens, and post-project rehabilitation are a few of the options available for preventing impacts in these situations.

Decisions regarding the methods used to avoid adverse impact to significant archaeological sites are made by INL professional archaeologists and, in regular communications with the Shoshone-Bannock Tribes when the project involves sites of importance to the Tribes, documented and retained in the INL CRM Office files and summarized in reports to the Idaho SHPO, Advisory Council, Shoshone-Bannock Tribes, and applicable interested parties.

While avoidance through project modification is the preferred option for avoidance of adverse effects to INL archaeological resources, it is not always feasible. In the case of an unavoidable adverse effect, DOE-ID and the INL CRM Office are committed to direct and meaningful consultation with the Idaho SHPO, Shoshone-Bannock Tribes, and other interested parties and stakeholders to develop measures to minimize or mitigate the adverse impact. The INL CRM Office begins this process by preparing a summary report (see Figure 29).

Decisions about the most appropriate methods for mitigating or minimizing adverse impacts to significant archaeological sites are always made in consultation with the Idaho SHPO, Shoshone-Bannock Tribes, and other stakeholders and interested parties. When this situation arises, the INL CRM Office prepares a summary report for the project according to the standard format presented here as Figure 29. Critical pieces of information included within this report are:

- A description of the project and its area of potential effect
- A description of the steps taken to identify archaeological resources within this area
- Descriptions of the affected cultural resources, including site recording forms and significance evaluations
- A description of how the project will affect cultural resources
- A site treatment plan that proposes measures to be taken to mitigate or minimize adverse effects
- Copies or summaries of any views provided by consulting parties and the public.



---

Copies of this documentation are provided to the consulting parties for a 30-day review period. During this time, all parties work together to consider the actions proposed by the INL CRM Office to minimize or mitigate impacts to archaeological sites and agree upon a final plan to complete the project. When concurrence is reached, the INL CRM Office provides documentation of all efforts to the INL cultural resource management archives and INL project manager, then the project can proceed under the stipulations for archaeological resource protection outlined in the final plan.

Once the Idaho SHPO has determined that sufficient information has been provided, consulting and interested parties are given 30 days to review this material and provide their views. The Advisory Council is also notified of the finding of adverse effect at this time and may choose to enter the consultation process, notifying all parties and the secretary of Energy of this fact within 15 days.

Consultation conducted in good faith, as previously described, should lead to agreement on appropriate strategies to mitigate or minimize the adverse effects of the proposed INL project. Commitments are formalized in a memorandum of agreement signed by DOE-ID, the Idaho SHPO, and other involved parties. INL project management is then formally notified that the project can proceed. Monitoring throughout the life of the project helps to ensure that all measures stipulated in the MOA are implemented. If agreement cannot be reached through consultation, DOE-ID will formally ask the Advisory Council to join the consultation. In making a final decision about the project, DOE will carefully consider the comments of all parties to the consultation, including those of the Advisory Council.

## **STANDARD REQUIREMENTS FOR ARCHAEOLOGICAL INVESTIGATIONS AT INL**

The sections to follow contain descriptions of the policies and procedures employed by the INL CRM Office in the identification, investigation, assessment, documentation, and preservation of INL archaeological resources.

### **Permitting**

From approximately 1990 on, the in-house staff of the INL CRM Office has conducted most archaeological investigations at INL. All work has followed the requirements and guidelines outlined herein. Permits are not required for internal archaeological investigations completed by the INL CRM Office. Outside agencies, subcontractors, and individuals completing archaeological investigations at INL are subject to permits. For investigations conducted before 1990, the NPS or BLM issued permits for archaeological investigations at INL. Today permits are handled through the INL CRM Office.

The permit process established specifically for INL archaeological investigations by external organizations accomplishes the following:

- Protects archaeological resources from unauthorized or poor-quality research and recovery
- Allows DOE-ID and the INL CRM Office to track and archive field and laboratory work and acquire information important to the description, protection, and overall management of INL cultural resources
- Ensures compliance with special INL safety, security, and environmental requirements
- Allows for timely notification of the Shoshone-Bannock Tribes prior to initiation of work and ensures appropriate notifications if sensitive cultural resources or areas are unexpectedly encountered

- 
- Ensures consistency in and informs applicants of INL standards for cultural resource inventories and research and testing excavations.

An applicant for a cultural resource permit (see Figure 30) must delineate the scope and purpose of the proposed investigation; demonstrate the necessary professional credentials and adequate support to conduct and complete the work; agree to any stipulations for health and safety, land use, access, and site remediation; and designate an approved repository for documents and artifacts associated with the project, which remain the property of DOE-ID.

## **Archive and Literature Searches**

The INL CRM Office maintains a comprehensive archive of all archaeological investigations completed at INL, including information on all known archaeological resources. Maintenance of these archives is an important function of the INL CRM Office and accomplishes a number of goals, including:

- Helping to ensure overall consistency in cultural resource management and data collection
- Continued refinement of overall INL CRM Office goals (see Appendix J), research designs (see Appendix E), and historic contexts (see Appendix F)
- Continuing refinement of the INL predictive model for prehistoric archaeological resources and associated research goals
- Preventing duplication of effort in archaeological resource identification
- Contributing to overall compliance with 36 CFR Part 79, “Curation of Federally-Owned and Administered Archaeological Collections.”

Archive and literature searches are the first step toward completing any kind of archaeological investigation at INL. Archives maintained in the INL CRM Office and consulted at this time may include:

- INL CRM Office files, which contain detailed information on all archaeological investigations conducted at INL and all archaeological sites known to occur there
- Archaeological sensitivity maps, which divide INL into four differing zones of sensitivity (very high, high, medium, or low) based on the locational tendencies of prehistoric sites previously recorded there
- Historic land use maps, which depict early historic roads, rail lines, trails, and canals crossing INL, along with structures and buildings, as described in various historical documents and sources
- Maps and notes created by surveyors during the original land surveys that began in 1873 and many subsequent land surveys of the INL area
- Various INL-specific archives, including maps and documents describing post-1942 activities and facilities
- Archaeological reports, documents, and other literature of relevance to INL and the surrounding region.

The archive and literature search is designed to evaluate previous efforts, identify cultural resources within an area of interest, and assemble information about any archaeological resources that may have been previously recorded there. In situations where an area of potential effect for a proposed project is being assessed, the archive and literature search serves an important role in assessing the need for additional archaeological survey, data recovery, and consultation.

---

## Archaeological Surveys

Field activities conducted by the INL CRM Office or by any entity under permit through the INL CRM Office will follow basic safety and security protocols for vehicle operation, communication, and field work, including any unique health and safety requirements associated with specific INL facilities.

Archaeological surveys at INL may be conducted for a variety of reasons. Some are conducted in advance of specific INL projects to assess the potential effects of the proposed activities. However, within available funding, the INL CRM Office also conducts inventories to expand understanding of the overall resource base and enhance long-term planning, overall management, and predictive modeling as a tool for land use decision-making. Since 1984, all archaeological surveys at INL have followed a consistent set of standards and procedures to ensure consistency and replicability.

Nearly two decades of on-the-ground investigations have demonstrated that INL archaeological resources are easily identified through pedestrian survey methods. Even in active geomorphological settings (e.g., after range fires and in the dune fields within the bed of Pleistocene Lake Terretton), INL archaeological resources that span all time periods of human habitation are densely concentrated on the existing surface of the ground (40 to 50 resources per square mile). Nearly all appear to have some surface manifestation that can be identified and assessed by a pedestrian survey crew. Experience has shown that survey intervals of 15 to 20 meters are ideal for identifying 90 to 100% of archaeological sites at INL.

The first step in completing an archaeological survey at INL is to establish the boundaries of the area to be surveyed. This will vary tremendously according to the needs of each particular project. For project-specific archaeological surveys, the entire area of potential effect for the proposed project is always intensively examined and inventoried. Global Positioning System (GPS) technology has proven to be very helpful in establishing the boundaries of archaeological survey units as well as the archaeological sites identified within them.

To identify archaeological resources within the defined survey area, archaeological survey crews systematically walk over the area in skirmish line fashion. Spacing between individuals in the skirmish line never exceeds 20 meters, and temporary flagging tape or pin-flag markers are often employed to ensure that an area is completely examined. Notations of survey transect orientation, survey participants, field and weather conditions, and other details deemed pertinent are also created by the survey crew leader.

When cultural materials are encountered during the course of a survey, intensive searches in the vicinity are used to ascertain the boundaries of the resource and pinpoint diagnostic artifacts, artifact concentrations, cultural features, landmarks, and any areas of post-depositional disturbance. The survey crew leader assigns a temporary field number to the resource and establishes its geographical coordinates.

Prior to conducting formal recording procedures, identified resources are classified generally as "isolates" or "sites," a distinction that applies to all archaeological materials at INL, including prehistoric (>150 years old), historic (50 to 100 years old), and industrial (<50 years old) materials.

In all projects at INL since 1984, archaeological "sites" have been defined as discrete concentrations of ten or more artifacts separated from similar concentrations by natural barriers, such as basalt ridges or the Big Lost River, or by at least 100 meters of open space. In active geologic settings (e.g., sand dunes and burned areas), small concentrations of less than ten items may also be designated as "sites" because of the potential for buried materials. Additionally, resources that contain fire-cracked rock, burned bone, or cultural features (e.g., rock rings, fire hearths, building foundations, trails, and canals) are also classified

---

as "sites" because these items are indicative of fairly intensive activities and often mark the location of buried cultural features.

Occurrences of less than ten artifacts under similar circumstances are classified as "isolates." These small artifact concentrations are restricted to a surface context and thus limited in their value for future research. At the discretion of the survey crew leader, single unmodified lithic flakes and/or tin cans, which would typically be recorded as "isolates," may be simply noted on survey maps as "outliers" to known or newly recorded archaeological sites nearby, and not formally recorded. Multiple flakes or cans and all diagnostic artifacts will always be formally recorded as part of a larger archaeological site or individually as an isolate location.

Formal recording of sites is completed using Intermountain Antiquities Computer System (IMACS) site forms modified to reflect INL needs (see Figure 31). These forms require detailed administrative, environmental, and descriptive information in a standardized regional format. They are designed to obtain the maximum amount of information from each resource without test excavations and with only minimal collection of artifacts. Isolates are documented with an abbreviated version of the standard INL IMACS form (see Figure 31).

Scaled planimetric maps are also prepared for all "sites," while less formal sketch maps are drawn for "isolates." The purpose of these maps is twofold: (1) to locate the resource in relation to features of the surrounding environment, both natural and cultural; and (2) to illustrate the spatial relationships between diagnostic artifacts, artifact concentrations, cultural features, and collected items within the perimeter of the site. To complete this site mapping, datum positions are established at each resource location. To aid in future relocation, prominent modern features, such as power poles or fence posts, are often utilized. In some instances, small cairns constructed of basalt cobbles or pebbles are constructed. Site datum positions are always noted on the INL IMACS form, particularly when they consist of cairns constructed by the survey crew. Directions to all important features of each site are typically obtained with GPS technology.

Artifacts and information collected during the survey may be subject to a variety of analyses. At a minimum, this will include basic functional and stylistic description of all collected artifacts and incorporation of each recorded archaeological resource into the database for predictive modeling. Other technical analysis (e.g., GIS analysis, obsidian hydration analysis, and blood protein analysis) may also be conducted. Reporting of all archaeological survey efforts is mandatory and follows guidelines described in a subsequent section of this appendix.

## **Excavations**

Plans for archaeological excavations at INL are reviewed in advance by the Idaho SHPO, Shoshone-Bannock Tribes, and INL safety and environmental personnel. These reviews ensure the scientific merit of the proposed investigation; anticipate and address any American Indian concerns; and ensure that all activities fall within INL security, safety, and environmental requirements. Several types of excavation are possible:

- Test excavations
- Full-scale excavations
- Salvage excavations
- Excavations involving human remains
- Paleontological excavations.

---

These excavations share a common methodological foundation while varying considerably in their overall goals.

## **Test Excavations**

Test excavations are small in scale and primarily designed to assess future research potential and establish National Register eligibility. At INL, they are patterned after an existing framework established for National Register evaluations of large dispersed artifact scatters (e.g., Henrikson and Holmer 1991; Ringe 1990, 1992a, 1992b, 1993, 1994; Thompson and Lohse 1992) and are generally guided by the practical objectives:

1. To determine the presence or absence of buried cultural materials
2. To determine if buried cultural deposits are present and, if present, to assess their general nature and extent.

These objectives are achieved through an approach that involves intensive systematic surface reconnaissance, small systematically placed shovel probes, and formal 1 x 1 m test units. The exact details of any given test excavation will differ according to the site being investigated and will always be presented in the context of a specific research design. In general however, the use of these basic techniques allows for an expedient yet thorough assessment of the subsurface character of an archaeological site with minimal impact to the cultural deposits and can be used to assess the significance of all types of archaeological resources.

Seven basic tasks are required in the test excavation and site evaluation process:

1. Grid establishment
2. Site mapping
3. Surface artifact collection
4. Shovel probe excavation
5. 1 x 1 m test unit excavation
6. Artifact analysis
7. Report preparation.

During the first stage of the evaluation, horizontal grid systems consisting of 5 x 5 m or 10 x 10 m units oriented to magnetic north are established at each site. Ten-meter intervals between grid lines are utilized only for those sites that are very large and widely dispersed; most sites investigated at INL are discreet enough to be gridded at 5-m intervals. The central datum point at each site (usually designated as 1000 N, 1000 E) is tied to the INL GIS through the use of a GPS device. Each site is marked with a permanent datum, typically a steel rebar stake.

During the second stage of evaluation, a planimetric map is prepared that illustrates the position of the site and grid in relation to surrounding features and indicating spatial relationships among artifacts. Surface artifacts are the focus of the third stage in evaluation. At this time, temporally and/or functionally diagnostic surface artifacts are plotted within the site grid, recorded, and collected for later analysis. In addition, approximately 50% of nondiagnostic surface artifacts, primarily unmodified flakes, are collected from systematic "checkerboard" samples of the grid units across the entire surface area of the site. This allows for subsequent analysis of the artifacts (e.g., obsidian hydration and faunal and stone tool analysis) and may reveal intrasite patterning that could provide clues to previous areas of activity at the site. In grid

---

units not subject to full collection, artifacts are counted and logged, but not removed from their original positions.

In the fourth and fifth stages of evaluation, attention is given to the subsurface character of each site. Initially, this involves excavation of small shovel probes at regular grid intervals of 5 m or 10 m across the site area to determine the depth and lateral extent of the site. All probes are square, measure 30 x 30 cm, and are excavated to at least 30 cm below existing ground surface or to bedrock, in 10-cm levels. In order to confirm that no cultural materials are present, excavations proceed to at least 10 cm below the last artifact-bearing level.

Deposits from the test probes are screened through a  $\frac{1}{8}$ -in. (minimum) hardware mesh; and recovered artifacts are logged, bagged, and collected with careful notation of horizontal and vertical provenience. The holes resulting from test probe excavations are immediately backfilled with original soils captured on a tarp placed beneath the screen. This helps to protect the surface of the site from soil mixing and disturbance from intensive foot traffic during the archaeological evaluation.

The excavation of test pits expands the investigation of a site to an evaluation of its potential significance by increasing subsurface exploration and focusing on features or areas of high artifact concentration. The methods utilized during excavation of 1 x 1-meter test pits are identical to those used during shovel testing, with the following important exceptions:

1. First, all 1 x 1-meter-square pits are taken to at least 40 cm below existing ground surface, bedrock, or to 20 cm below the deepest artifacts. Excavation may proceed in arbitrary 10-cm levels or stratigraphically, as the situation demands.
2. Second, after completion of the excavation, measured profiles are drawn of at least one wall within each pit, soil horizons and/or cultural features are described and may be sampled, and photographs are taken. Several types of field samples may be taken from established 20 x 20-cm columns in the test units or in selected other areas. Samples that may be obtained include fine-mesh screen ( $<\frac{1}{8}$  in.) samples, soil samples, pollen samples, charcoal samples, and samples of organic materials.
3. Third, in contrast to shovel probes, which are systematically placed, the 1 x 1-meter pits are located intuitively in areas expected to contain subsurface artifacts or features. Clues used to determine the placement of the 1 x 1-meter pits are provided by the results of the systematic shovel probes and surface artifacts. When excavation is complete, all 1 x 1-meter pits are backfilled with soil captured on tarps placed beneath the screen.
4. Finally, test units are usually seeded with a mixture of native plants to help prevent the spread of noxious weeds.

Analyses of artifacts and samples recovered from test pits or shovel probes may include any of the following activities, and possibly more. Specialists and/or special facilities may be utilized to complete these analyses:

- Sedimentary and soil chemistry analyses
- Radiocarbon analysis
- Dendrochronological analysis
- Flotation analysis of soil samples for plant macrofossils
- Fine-screening of soil samples for analysis of micro-artifacts
- Pollen analysis



- 
- Stylistic and functional analysis of metal, glass, ceramic, stone, and bone artifacts, including debitage
  - Micro-wear analysis of artifacts, particularly stone tools
  - Obsidian sourcing and hydration analysis
  - Faunal analysis, including, when possible, data on taxa, element, age, sex, season of death, and modification
  - Blood protein analysis.

Reporting of test excavations is mandatory and follows the guidelines presented in a subsequent section of this appendix.

### **Full-Scale Excavations**

As with other types of archaeological excavations at INL, full-scale excavations follow an established data recovery plan and research design reviewed and approved by appropriate consulting parties prior to any ground disturbance. At a minimum, full-scale excavations follow the basic methodological protocols discussed under test excavations. Any deviations from these basics are justified in the project excavation plan. Compliance with occupational safety and health rules and INL-specific security, environmental, safety, and health requirements are also monitored and strictly enforced.

### **Salvage Excavations**

Salvage excavations are typically prompted by an unanticipated discovery of cultural materials during an ongoing INL or ICP project or as a followup to emergency situations where cultural resources have been impacted (e.g., fire or flood). Obviously, each situation and data recovery plan and research design will be unique; but once again, the minimum standards described under the test excavation discussion are followed and basic INL security, safety, and environmental requirements are enforced.

### **Excavations Involving Human Remains**

Due to the potential cultural, religious, and legal sensitivity connected with excavations involving human remains, it is particularly important that this type of excavation follows a specific plan developed in consultation with the interested parties (i.e., Idaho SHPO, Shoshone-Bannock Tribes, and other impacted groups).

The following general approach is employed whenever clusters of human-sized bones are encountered at INL:

1. The finder stops project activities in the vicinity of the bones, establishes a 30- by 50-meter buffer around them, and immediately contacts the INL CRM Office and the DOE-ID cultural resource coordinator.
2. The DOE-ID cultural resources coordinator notifies the Shoshone-Bannock Tribes and jurisdictional county sheriff's office of the find.
3. As soon as possible and within at least two days of the discovery, the INL CRM Office investigates the find and determines if the bones are human, and if human, determines whether they are ancient or modern, and thereby establishes jurisdiction as either local law enforcement (modern) or INL management (ancient or historic). The INL CRM Office also coordinates visits to and inspections of the area by other interested parties within this window of time.
4. Depending on the nature of the find, the INL CRM Office also recommends additional measures for interim protection of the remains.



- 
5. If the remains fall under jurisdiction of local law enforcement, this procedure ends.
  6. If the remains fall under the jurisdiction of DOE-ID, consultation on protection, analysis (possibly including excavation), and disposition commences. If the remains are unidentifiable or American Indian, the Shoshone-Bannock Tribes is closely involved in this consultation along with the Idaho SHPO. If the remains are not American Indian but still historic, record searches and interviews with informants are used to locate parties for consultation.
  7. All activities under this procedure are conducted with the utmost respect for the sensitive nature of the find and the feelings of the parties involved.

## **Paleontological Excavations**

Some geological contexts at INL have been known to yield plant and animal fossils. The floodplain of the Big Lost River and bed of Pleistocene Lake Terretion are two areas where finds have occurred. Remains of this type are not associated with human activities but do have good potential to yield important information on climate and environment that can be important in understanding human occupation of the area. Like all other excavations at INL, paleontological excavations follow a specific data recovery plan and research design and comply with relevant environmental, safety, and health requirements. Reporting and documenting the find is mandatory and follows established protocols.

## **Significance Evaluations**

Archaeological significance evaluations play an important part in determining which archaeological resources warrant consideration with regard to long-term land use planning, impact-driven planning, and overall management. Many INL archaeological resources are evaluated against a specific set of guidelines (36 CFR Part 60.4) established to govern nomination to the National Register. Under these guidelines, cultural resources must retain integrity of location, design, setting, materials, workmanship, feeling, and association; and must meet one or more of the following four criteria:

1. Association with events that have made a significant contribution to the broad patterns of our history
2. Association with the lives of persons significant in our past
3. Embodiment of the distinctive characteristics of a type, period, or method of construction; representative of the work of a master; possessing high artistic values; or representative of a significant distinguishable entity whose components may lack individual distinction
4. Yielded or may be likely to yield information important to prehistory or history.

Most archaeological resources are eligible under criterion 4, although certain sites may meet any of the criteria. Historic sites may be especially eligible under criteria 1 and 2. Usually, sites that are eligible under criterion 4 will be datable, have stratigraphic integrity, and will contain sufficient materials to address one or more of the research questions provided in the draft INL Archaeological Research Design provided in Appendix E. Subsurface testing may be required to fully assess the National Register potential of many archaeological sites. In accordance with guidance from the Idaho SHPO, all archaeological sites at INL are considered to be eligible to the National Register under criterion 4 until it is demonstrated that no information remains to be gleaned from their deposits or surface features. Archaeological isolates are considered to be ineligible if they are restricted to a surface context.

Archaeological or other cultural resources that are not eligible for nomination to the National Register may still be considered significant and worthy of preservation under various other legal authorities (NEPA, ARPA, AIRFA, and NAGPRA; see Appendix A).

---

## Collection and Removal of Artifacts

Artifacts have been collected from INL archaeological resources during past investigations, and similar collections will be assembled in the future under the basic procedures established herein. The following rules will serve as a protocol for future activities:

- The collection of artifacts from INL lands by unauthorized personnel is prohibited by law and actively discouraged by the INL CRM Office. Violations of this rule will be investigated and, when possible, prosecuted under appropriate legal authorities (e.g., ARPA and NAGPRA).
- Although arrowheads collected from the surface on federal lands are specifically exempt from the penalty provisions of ARPA, their collection remains illegal and is punishable under other statutes.
- INL CRM Office employees and/or individuals under permit from the INL CRM Office may collect artifacts in accordance with established research designs and priorities or if they are judged to be in imminent danger of loss by INL project activities, natural forces, or unauthorized collection.
- Artifact collections created during archaeological surveys or excavations will follow the protocols and guidelines outlined in specific data recovery plans and in accordance with 36 CFR 79.
- All collections will be permanently curated at the Southeastern Idaho Regional Archaeological Center, located at the Idaho Museum of Natural History of Idaho State University in Pocatello Idaho. The collections will be maintained under standards established in 36 CFR Part 79 and the authority of a formal memorandum of agreement between the curation center and DOE-ID. Collections temporarily stored in the INL CRM Office will remain in secure fireproof storage until they are transferred for permanent curation. Organic materials or otherwise delicate or sensitive materials will be transferred immediately for appropriate storage.

## Documentation and Reporting

Documentation standards for INL cultural resource investigations have been established to ensure that the collected information contributes to a better understanding of the archaeology of Idaho and the nation. Consistent formats are employed to ensure that the assumptions and biases affecting the conduct and results of the reported work are clearly stated and consistently reported. This consistency also helps to ensure that information about INL cultural resources is up to date and easily accessible. Information distributed by the INL CRM Office must undergo appropriate INL security and patent reviews before being disseminated outside the INL system.

Cultural resource investigations conducted at INL are documented in at least one of three basic formats:

1. **Summary of Cultural Resource Investigation** (see Figure 28)—A broad description of cultural resource investigations completed at INL. If no cultural resources are identified during an archaeological survey of a given INL area, this summary is the only written document prepared.
2. **Standard Report of Cultural Resource Investigation** (see Figure 29)—A format based closely on documentation requirements distributed by the Idaho SHPO. It is used to document archaeological investigations at INL that result in the recording or re-recording, avoidance, or mitigation of any type of archaeological resource.
3. **INL external report**—A document that follows a formal INL scientific and technical information format intended for release to entities external to INL. It is used for large projects and those judged to be of potential interest to parties outside of the INL system. Although presenting a different

---

appearance from the previous formats, the content of this type of document closely follows the standards of the Idaho SHPO as provided in Figure 29.

In addition, identified archaeological resources and boundaries of intensively surveyed areas are tracked on paper and electronically in databases and GIS files. Finally, approval of this revision of the INL Cultural Resource Management Plan initiates development of yearly and quarterly reports detailing INL cultural resource management activities conducted since the last reporting period.

---

<p style="text-align: center;"><b>Idaho National Laboratory</b> <b>Cultural Resource Management Office</b> <i>Summary of Cultural Resource Investigation</i></p> <p><b>INL CRM Office Project Number:</b></p> <p><b>INL CRM Office Project Name:</b></p> <p><b>Project Description:</b></p> <p><b>Environmental Checklist Number:</b></p> <p><b>Customer/Primary Contact:</b></p> <p><b>Project Location:</b></p> <p><b>Nearest INL Facility:</b></p> <p><b>Type of Cultural Resource Investigation:</b></p> <p><b>Principal Investigator:</b></p> <p><b>Dates of Investigation:</b></p> <p><b>INL CRM Office Permit Number:</b></p> <p><b>Project Status:</b></p> <p><b>Acres Surveyed (Intensive):</b></p> <p><b>Acres Surveyed (Reconnaissance):</b></p> <p><b>Acres Re-surveyed:</b></p> <p><b>Cultural Resources Recorded:</b></p> <p><b>Cultural Resources Re-recorded:</b></p> <p><b>Cultural Resources Excavated:</b></p> <p><b>Cultural Resources Avoided:</b></p> <p><b>Documentation of Investigation:</b></p> <p><b>Assessment of Effects:</b></p> <p><b>Recommended Actions:</b></p> <p><b>SHPO Comments:</b></p> <p><b>Sho-Ban Comments:</b></p> <p><b>Other Stakeholder Comments:</b></p>
--

Figure 28. INL Cultural Resource Management Office project summary.

**Idaho National Laboratory**  
**Cultural Resource Management Office**  
*Standard Report of Cultural Resource Investigation*

**INTRODUCTION**

Area of Potential Effects

Project Acreage

Landowners

**STATEMENT OF OBJECTIVES FOR INVESTIGATION**

Description of Area Investigated

Amount and Types of Information Collected

**LOCATION AND GENERAL ENVIRONMENTAL SETTING**

Legal Locations

Setting

**PRE-FIELD RESEARCH**

Sources of Information Checked

Summary of Previous Investigations

Evaluation of Previous Investigations

**EXPECTED HISTORIC AND PREHISTORIC LAND USE AND SITE DENSITY**

Known Cultural Resources

Expected Cultural Resources

Known or Expected Distribution of Cultural Resources

Known or Expected General Themes and Time Periods

Known or Expected INL Contexts

**METHODS OF INVESTIGATION**

Field Techniques

Surface Conditions

Areas Not Examined

Field Personnel

Dates of Fieldwork

Problems Encountered

**RESULTS**

All Cultural Resources Identified in the Area of Potential Effects

Cultural Resources Noted But Not Recorded

Summary of Important Characteristics of Identified Resources

National Register Eligibility

Recommendations for Further Investigations

**CONCLUSIONS AND RECOMMENDATIONS**

Summary of Investigations

Potential Threats to Identified Cultural Properties

Relationship of Identified Cultural Properties to Project Impacts

Avoidance or Mitigation Options

Recommendations for Additional Investigations or Protection Measures

**REPOSITORY**

**REFERENCES**

**APPENDIX A: Key Information**

**APPENDIX B: Certification of Results**

**APPENDIX C: Project Maps**

**APPENDIX D: Site/Isolate Forms**

Figure 29. Standard report format for INL archaeological investigations.

<p style="text-align: center;"><b>Idaho National Laboratory</b></p> <p style="text-align: center;"><b>Cultural Resource Management Office</b></p> <p style="text-align: center;"><i>Cultural Resources Investigation Permit Application</i></p> <p>Applicant must include the following items with the application form:</p> <ul style="list-style-type: none"> <li>• Summary of organizational capabilities including information on facilities and equipment, organizational structure and staffing to be involved in the proposed work;</li> <li>• Summary of organizational experience and history in completing work of the kind proposed, including similar past projects, government contracts, federal permits, reports and/or publications resulting from similar work, and any other pertinent organizational experience.</li> <li>• For each individual named as responsible for supervisory roles or technical tasks, a curriculum vita or other resume or summary of education, training, and experience in the kind of work proposed in the role proposed.</li> <li>• Comprehensive list of all individuals that will be involved in the proposed work including the following information: Full Name, Social Security Number, Date of Birth, and Citizenship.</li> </ul> <p style="text-align: center;"><b>Application Form</b></p> <ol style="list-style-type: none"> <li><b>1. Name of Applicant (Institution, Corporation, Partnership, Individual, or Other Entity):</b></li> <li><b>2. Mailing Address:</b></li> <li><b>3. Telephone Numbers, Fax Numbers, and E-mail Addresses:</b></li> <li><b>4. Description and Purpose of Proposed Work:</b></li> <li><b>5. Location of Proposed Work (Include copy of U.S.G.S. 7.5' map with appropriate annotations):</b></li> <li><b>6. Cultural Resources Involved in Proposed Work (Include completed site recording forms and other forms of existing documentation):</b></li> <li><b>7. Schedule of Proposed Work:</b></li> <li><b>8. Curatorial Provisions:</b></li> <li><b>9. Plans for Tribal or Public Outreach:</b></li> <li><b>10. Name of Individual(s) Responsible for Planning and Supervising Field Work, Approving Reports, Completing National Register Evaluations, and Providing Recommendations:</b></li> <li><b>11. Name of Individual Responsible for Carrying Out the Terms and Conditions of the INL CRM Office Permit for Archaeological Investigations (must be legally empowered to obligate participant organization):</b></li> <li><b>12. Signature of Principal Investigator:</b></li> </ol>
---

Figure 30. INL CRM Office permit application for archaeological investigations.



**Idaho National Laboratory  
Cultural Resource Management Office**

**Isolated Find Record**

**State #:** \_\_\_\_\_ **Temp #:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
**Project:** \_\_\_\_\_  
**Recorder:** \_\_\_\_\_  
**Location:** \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 **Sec.:** \_\_\_\_\_ **T:** \_\_\_\_\_ **R:** \_\_\_\_\_ **Meridian:** \_\_\_\_\_  
**UTM Zone** \_\_\_\_\_, \_\_\_\_\_ meters E \_\_\_\_\_ meters N  
**USGS Quad:** \_\_\_\_\_ **County:** \_\_\_\_\_ **State:** \_\_\_\_\_  
**Landowner:** \_\_\_\_\_  
**Soil:** \_\_\_\_\_

**Topography:** \_\_\_\_\_

**Slope:** \_\_\_\_\_ **Aspect:** \_\_\_\_\_ **Elevation:** \_\_\_\_\_  
**Nearest Water:** \_\_\_\_\_  
**Vegetation:** \_\_\_\_\_

**Additional Comments:** \_\_\_\_\_

\*\*\*\*\*  
**Artifacts:**

**Inferred Function/Description:**

**Cultural Affiliation:**

**Dimensions:**

**Collection?** \_\_\_\_\_ Yes \_\_\_\_\_ No **#of items** \_\_\_\_\_ **Repository:** \_\_\_\_\_  
**Sketch?** \_\_\_\_\_ Yes \_\_\_\_\_ No **#of items** \_\_\_\_\_

\*\*\*\*\*  
**Sketch Map, Artifact Sketch, etc.**

Figure 31. Intermountain Antiquities Computer System forms, INL variation.

**Idaho National Laboratory  
Cultural Resource Management Office**

**IMACS SITE FORM  
Part A - Administrative Data**

\*1. State No.: \_\_\_\_\_ \*2. Agency No.: \_\_\_\_\_ \*3. Temp. No. \_\_\_\_\_  
4. State: \_\_\_\_\_ County: \_\_\_\_\_  
5. Project: \_\_\_\_\_  
6. Report No.: \_\_\_\_\_  
7. Site Name: \_\_\_\_\_  
8. Class: ☐ Prehistoric ☐ Historic ☐ Paleontologic ☐ Ethnographic  
9. Site Type: \_\_\_\_\_  
\*10. Elevation: \_\_\_\_\_ ft. \*11. UTM Grid Zone: \_\_\_\_\_ m E \_\_\_\_\_ m N  
\*12. \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_ T. \_\_\_\_\_ R. \_\_\_\_\_  
\*13. Meridian: \_\_\_\_\_  
\*14. Map Reference: \_\_\_\_\_  
15. Aerial Photo: \_\_\_\_\_  
16. Location and Access: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\*17. Land Owner: \_\_\_\_\_  
\*18. Federal Administrative Units: \_\_\_\_\_  
\*19. Location of Curated Materials: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
20. Site Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
21. Site Condition: ☐ Excellent (A) ☐ Good (B) ☐ Fair (C) ☐ Poor (D)  
\*22. Impact Agent(s): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
23. National Register Status ☐ Significant (C) ☐ Non-Significant (D) ☐ Unevaluated (Z)  
Justify: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
24. Photos: \_\_\_\_\_  
25. Recorded by: \_\_\_\_\_  
\*26. Survey Organization: \_\_\_\_\_ \*28. Survey Date: \_\_\_\_\_  
27. Assisting Crew Members: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Figure 31. (Continued.)

## Part A - Environmental Data

Site No.(s) \_\_\_\_\_

\*29. Slope: \_\_\_\_\_ °

Aspect: \_\_\_\_\_ °

\*30. Distance to Permanent Water: \_\_\_\_\_ (x 100 meters)

\*Type of Water Source: ☐ Spring/Seep (A) ☐ Stream/River (B) ☐ Lake (C) ☐ Other (D)

Name of Water Source: \_\_\_\_\_

\*31. Geographic Unit: \_\_\_\_\_

\*32. Topographic Location:

### PRIMARY LANDFORM:

- |   |   |
|---|---|
| <input type="checkbox"/> Mountain Spine (A) | <input type="checkbox"/> Alluvial Fan (A) |
| <input type="checkbox"/> Hill (B)           | <input type="checkbox"/> Alcove/Shltr (B) |
| <input type="checkbox"/> Mesa (C)           | <input type="checkbox"/> Arroyo (C)       |
| <input type="checkbox"/> Ridge (D)          | <input type="checkbox"/> Basin (D)        |
| <input type="checkbox"/> Valley (E)         | <input type="checkbox"/> Cave (E)         |
| <input type="checkbox"/> Plain (F)          | <input type="checkbox"/> Cliff (F)        |
| <input type="checkbox"/> Canyon (G)         | <input type="checkbox"/> Delta (G)        |
| <input type="checkbox"/> Island (H)         | <input type="checkbox"/> Monolith (H)     |

### SECONDARY LANDFORM:

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Dune (I)        | <input type="checkbox"/> Slope (Q)         | <input type="checkbox"/> Riser (Y)       |
| <input type="checkbox"/> Floodplain (J)  | <input type="checkbox"/> Terrace/Bench (R) | <input type="checkbox"/> Multiple (1)    |
| <input type="checkbox"/> Ledge (K)       | <input type="checkbox"/> Talus Slope (S)   | <input type="checkbox"/> Bar (2)         |
| <input type="checkbox"/> Mesa/Butte (I)  | <input type="checkbox"/> Island (T)        | <input type="checkbox"/> Lagoon (3)      |
| <input type="checkbox"/> Playa (M)       | <input type="checkbox"/> Outcrop (U)       | <input type="checkbox"/> Eph Wash (4)    |
| <input type="checkbox"/> Port Fea (N)    | <input type="checkbox"/> Bog (V)           | <input type="checkbox"/> Kipuka (5)      |
| <input type="checkbox"/> Plain (O)       | <input type="checkbox"/> Valley (W)        | <input type="checkbox"/> Saddle/Pass (6) |
| <input type="checkbox"/> Ridge/Knoll (P) | <input type="checkbox"/> Cutbank (X)       | <input type="checkbox"/> Graben (7)      |

Describe: \_\_\_\_\_

\*33. On-site Depositional Context:

- |   |   |  |  |
|---|---|--|--|
| <input type="checkbox"/> Fan (A)            | <input type="checkbox"/> Outcrop (Q)        | <input type="checkbox"/> Moraine (J)         | <input type="checkbox"/> Desert Pavement (P) |
| <input type="checkbox"/> Talus (B)          | <input type="checkbox"/> Extinct Lake (F)   | <input type="checkbox"/> Flood Plain (K)     | <input type="checkbox"/> Stream Bed (R)      |
| <input type="checkbox"/> Dune (C)           | <input type="checkbox"/> Extant Lake (G)    | <input type="checkbox"/> Marsh (L)           | <input type="checkbox"/> Aeolian (S)         |
| <input type="checkbox"/> Stream Terrace (D) | <input type="checkbox"/> Alluvial Plain (H) | <input type="checkbox"/> Landslide/Slump (M) | <input type="checkbox"/> None (T)            |
| <input type="checkbox"/> Playa (E)          | <input type="checkbox"/> Colluvium (I)      | <input type="checkbox"/> Delta (N)           | <input type="checkbox"/> Residual (U)        |

Description of Soil: \_\_\_\_\_

34. Vegetation:

\*a. Life Zone:

☐ Arctic-Alpine (A) ☐ Hudsonian (B) ☐ Canadian (C) ☐ Transitional (D) ☐ Upper Sonoran (E) ☐ Lwr Sonoran (F)

\*b. Community:

Primary On-Site	Secondary On-Site	Surrounding Site
Aspen (A)	Other/Mixed Conifer (G)	Grassland/Steppe (M)
Spruce-Fir (B)	Pinyon-Juniper (H)	Desert Lake Shore (N)
Douglas Fir (C)	Wet Meadow (I)	Shadscale Community (O)
Alpine Tundra (D)	Dry Meadow (J)	Tall Sagebrush (P)
Ponderosa Pine (E)	Oak-Maple Shrub (K)	Low Sagebrush (Q)
Lodgepole Pine (F)	Riparian (L)	Barren (R)
		Marsh/Swamp (S)
		Lake/Reservoir (T)
		Agricultural (U)
		Blackbrush (V)
		Mountain Brush (W)
		Juniper-Sage (2)

Describe: \_\_\_\_\_

\*35. Miscellaneous Text \_\_\_\_\_

36. Comments/Continuations \_\_\_\_\_

List of Attachments

☐ Part B  
☐ Part C

☐ Topo Map  
☐ Site Sketch

☐ Photos  
☐ Artifact/Feature Sketch

☐ Continuation Sheets  
☐ Other:

Figure 31. (Continued.)

**Part B - Prehistoric Sites**

Site No.(s) \_\_\_\_\_

1. Site Type \_\_\_\_\_

	CULTURAL AFFILIATION	DATING METHOD	CULTURAL AFFILIATION	DATING METHOD
2. Culture				

Describe: \_\_\_\_\_

3. Site Dimensions: \_\_\_\_\_ by \_\_\_\_\_ \*Area \_\_\_\_\_ sq. m

4. Surface Collection/Method: ☐ None (A) ☐ Grab Sample (B) ☐ Designed Sample (C) ☐ Complete Collection (D)

Sampling Method: \_\_\_\_\_

5. Estimated Depth of Cultural Fill: ☐ Surface (A) ☐ 0 - 20 cm (B) ☐ 20 - 100 cm (C) ☐ 100 cm+ (D) ☐ Fill noted but unknown (E) ☐ Depth suspected (F)

How estimated? (If tested, show location on site map): \_\_\_\_\_

6. Excavation Status: ☐ Excavated (A) ☐ Tested (B) ☐ Unexcavated (C)

Testing Method: \_\_\_\_\_

7. Summary of Artifacts and Debris:

<input type="checkbox"/> Lithic Scatter (LS)	<input type="checkbox"/> Isolated Artifact (IA)	<input type="checkbox"/> Burned Stone (BS)	<input type="checkbox"/> Bone Scatter (WB)
<input type="checkbox"/> Ceramic Scatter (CS)	<input type="checkbox"/> Organic Remains (VR)	<input type="checkbox"/> Ground Stone (GS)	<input type="checkbox"/> Charcoal (CA)
<input type="checkbox"/> Basketry/Textiles (BT)	<input type="checkbox"/> Shell (SL)	<input type="checkbox"/> Lithic Source(s): _____	

Describe: \_\_\_\_\_

*8. Lithic Tools	#	TYPE	#	TYPE

Describe: \_\_\_\_\_

\*9. Lithic Debitage – Estimated Quantity: ☐ None (A) ☐ 1 - 9 (B) ☐ 10 - 25 (C) ☐ 25 - 100 (D) ☐ 100 - 500 (E) ☐ 500 + (F)

Material Type: \_\_\_\_\_

Flaking Stages: (0) Not Present (1) Rare (2) Common (3) Dominant

Decortication: \_\_\_\_\_ Secondary \_\_\_\_\_ Tertiary \_\_\_\_\_ Shatter \_\_\_\_\_ Core \_\_\_\_\_

10. Maximum Density - # / sq m (all lithics) \_\_\_\_\_

Figure 31. (Continued.)

## Part B - Prehistoric Sites

Site No.(s) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

*11. Ceramic Artifacts:	#	TYPE	#	TYPE
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Maximum Density - # / sq m (all ceramics): \_\_\_\_\_

\*13. Non-Architectural Features (locate on site map):

<input type="checkbox"/> Hearth/Firepit (HE)	<input type="checkbox"/> Rubble Mound (RM)	<input type="checkbox"/> Earthen Mound (EM)	<input type="checkbox"/> Water Control (WC)
<input type="checkbox"/> Midden (MD)	<input type="checkbox"/> Stone Circle (SC)	<input type="checkbox"/> Burial (BU)	<input type="checkbox"/> Petroglyph (PE)
<input type="checkbox"/> Depression (DE)	<input type="checkbox"/> Rock Alignment (RA)	<input type="checkbox"/> Talus Pit (TP)	<input type="checkbox"/> Pictograph (PI)

Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\*14. Architectural Features (locate on site map):

#	MATERIAL	TYPE	#	MATERIAL	TYPE
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. Comments / Continuations:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Figure 31. (Continued.)

## Part C - Historic Sites

Site No.(s) \_\_\_\_\_

1. Site Type: \_\_\_\_\_

\*2. Historic Theme(s): \_\_\_\_\_

\*3. Culture

CULTURAL AFFILIATION	DATING METHOD	CULTURAL AFFILIATION	DATING METHOD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Describe: \_\_\_\_\_

\*4. Oldest Date: \_\_\_\_\_ Recent Date: \_\_\_\_\_

How Determined?: \_\_\_\_\_

5. Site Dimensions: \_\_\_\_\_ m by \_\_\_\_\_ m \*Area: \_\_\_\_\_ sq. m

\*6. Surface Collection/Method: ☐ None (A) ☐ Designed Sample (C)  
☐ Grab Sample (B) ☐ Complete Collection (D)

Sampling Method: \_\_\_\_\_

\*7. Estimated Depth of Cultural Fill: ☐ Surface (A) ☐ 20 - 100 cm (C) ☐ Fill noted but unknown (E)  
☐ 0 - 20 cm (B) ☐ 100 cm+ (D) ☐ Depth suspected (F)

How Estimated? (If tested, show location on site map) \_\_\_\_\_

\*8. Excavation Status: ☐ Excavated (A) ☐ Tested (B) ☐ Unexcavated (C)

Testing Method: \_\_\_\_\_

\*9. Summary of Artifacts and Debris:

<input type="checkbox"/> Glass (GL)	<input type="checkbox"/> Bone (BO)	<input type="checkbox"/> Leather (LE)	<input type="checkbox"/> Ammunition (AM)	<input type="checkbox"/> Domestic Items (DI)
<input type="checkbox"/> Metal (ME)	<input type="checkbox"/> Ceramics (CS)	<input type="checkbox"/> Wire (WI)	<input type="checkbox"/> Wood (WD)	<input type="checkbox"/> Kitchen Utensils(KU)
<input type="checkbox"/> Nails (NC,NW)	<input type="checkbox"/> Fabric (FA)	<input type="checkbox"/> Tin Cans (TZ)	<input type="checkbox"/> Rubber (RB)	<input type="checkbox"/> Car Parts (CR)

Describe: \_\_\_\_\_

\*10. Ceramic Artifacts:

paste	glaze/ slip	decoration	pattern	vessel forms	#
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

\*a. Estimated Number of Ceramic Trademarks \_\_\_\_\_

Describe: \_\_\_\_\_

Figure 31. (Continued.)



**Part C - Historic Sites**

Site No.(s) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_**\*11. Glass Artifacts:**

#	MANUFACTURE	COLOR	FUNCTION	TRADEMARKS	DECORATION
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

- a. Estimated Number of Glass Trademarks: \_\_\_\_\_  
Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Maximum Density - # / sq m (glass and ceramics): \_\_\_\_\_

**\*13. Non-Architectural Features (locate on site map):**

<input type="checkbox"/> Trail/Road (TR)	<input type="checkbox"/> Dump (DU)	<input type="checkbox"/> Earthen Dam (DA)	<input type="checkbox"/> Hearth/Campfire (HE)
<input type="checkbox"/> Mine Tailings (MT,ML)	<input type="checkbox"/> Depression (DE)	<input type="checkbox"/> Ditch (DI)	<input type="checkbox"/> Quarry (QU)
<input type="checkbox"/> Rock Alignment (RA)	<input type="checkbox"/> Cemetery/Burial (CB)	<input type="checkbox"/> Inscriptions (IN)	<input type="checkbox"/> Other (OT)

Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**\*14. Architectural Features (locate on site map):**

#	MATERIAL	TYPE	#	MATERIAL	TYPE
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**15. Comments / Continuations**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Figure 31. (Continued.)

---

**Part D — Paleontology Locality****Locality No.** \_\_\_\_\_

1. Type of Locality: ☐ Invertebrate ☐ Plant ☐ Vertebrate ☐ Trace ☐ Other
2. Formation/Horizon/Geologic Age: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Description of Geology and Topography: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Location of Outcrop: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Map Ref: USGS Quad: \_\_\_\_\_ Scale: \_\_\_\_\_ Min: \_\_\_\_\_ Ed \_\_\_\_\_  
\_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ Meridian \_\_\_\_\_
6. County \_\_\_\_\_ 7. Federal Administrative Unit(s) \_\_\_\_\_
8. Specimens Collected and Field Accession No.: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. Repository: \_\_\_\_\_
10. Specimens Observed and Disposition: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
11. Ownership: ☐ Private ☐ State ☐ BLM ☐ USFS ☐ NPS ☐ Ind. ☐ Mil. ☐ Other
12. Recommendations for Further Work or Mitigation: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
13. Type of Map made by Recorder: \_\_\_\_\_
14. Published References: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
15. Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
16. Sensitivity: ☐ Critical ☐ Significant ☐ Important ☐ Insignificant
17. Recorded by: \_\_\_\_\_
18. Date: \_\_\_\_\_

Figure 31. (Continued.)







## **Appendix D**

### **Strategies and Procedures for the Management of INL Historic Architectural Properties**







## Appendix D

# Strategies and Procedures for the Management of INL Historic Architectural Properties

## INTRODUCTION

Since its inception in 1949 as the NRTS, work conducted at INL has had a significant effect on the course of local, regional, national, and international history. Given this, it follows that many of the architectural properties associated with accomplishments in science and engineering at INL are representative reminders of those accomplishments and, as such, are historically important.

Formal recognition of the historic importance of INL programs and structures began in 1966 with the designation of EBR-I as a National Historic Landmark. However, it was not until the early 1990s that further consideration was given to post-1942 INL history and associated structures and artifacts. Increasing awareness of the historical importance of INL came about for a variety of reasons, primary among them were: (1) an increased focus on, and commitment to, compliance with all environmental laws and regulations; (2) the end of the Cold War, as marked by the removal of the Berlin wall; (3) changing INL programs and missions that led to increased alterations and demolition of older INL structures; (4) the 50<sup>th</sup> anniversary of DOE national laboratories associated with the Manhattan Project; and (5) the 50<sup>th</sup> anniversary of INL in 1999.

As an active scientific and engineering laboratory and one whose historic mission was the testing and development of nuclear power, INL presents unique challenges to historic preservation. These challenges include radiologically contaminated buildings and equipment; security restrictions; and the nearly constant modification, demolition, and replacement of structures and equipment to meet changing programmatic and mission needs. As a result of these challenges, what began in 1966 as a building-by-building approach to historic preservation of the INL built environment, has evolved and is continuing to evolve, into more holistic management strategies and systematic procedures for identifying, evaluating, and protecting important properties within a historic contextual framework. Contexts have been drafted, historic themes identified, and inventories of historic INL architectural properties are being continually expanded following the strategies and procedures outlined herein. These same strategies and procedures will be used to identify, evaluate, document, and protect additional INL architectural properties from the post-1942 era as legitimized through a programmatic agreement contained in Appendix G.

Inventories are ongoing to catalog other important INL architectural properties that may or may not be eligible to the National Register of Historic Places, such as nuclear-era artifacts and photographic and engineering archives. Strategies continue to evolve and be implemented through consultation and interactions at annual meetings that include:

- DOE-ID
- Idaho SHPO
- Shoshone-Bannock Tribes
- INL CRM Office
- Other interested parties.

The agreed-upon implementation of the prioritized strategies and associated timeframes will be reflected in changes to the activities schedule contained in Appendix L of this document.

---

## INL Historic Architectural Properties

For INL management purposes, a historic architectural property is defined as any post-1942 man-made structure or object that is either on, or eligible for listing on, the National Register. Examples might include the autopsy and surgical table housed in the former dispensary at the Central Facilities Area, the gantry crane used to load and unload ordnance during World War II, or the massive aircraft hangar at Test Area North; in other words, features of the INL “built environment”.

### History of INL Historic Architectural Investigations

Recognizing the historic significance of many INL architectural properties and associated artifacts—yet lacking an empirical approach to achieve National Register eligibility determinations—in 1993 the INL CRM Office initiated comprehensive surveys of DOE-ID-owned buildings as required by NHPA Section 110 (Braun 1996; Braun and Marler 1996). In 1997, a comprehensive building inventory survey was completed and historic contexts were drafted for use in conjunction with National Register criteria to arrive at eligibility evaluations for DOE-ID buildings. Specifically, the goals of this investigation were to:

- Prepare a contextual history of INL from 1942 to the present
- Prepare a detailed historic properties inventory of all DOE-ID-managed buildings
- Develop significance evaluations for each building based on applicable legal criteria and historic contexts
- Develop mitigation recommendations for each historic building in the event of future adverse effects
- Develop recommendations on ways to satisfy NHPA Section 106 and 110 requirements.

The buildings were inventoried and evaluated in terms of the following four major chronological contexts:

- Ordnance testing—1942 to 1949 and 1968 to 1970
- Nuclear reactor testing—1949 to 1970
- Multi-program research—1971 to the present
- Waste remediation—1970 to the present.

With these contexts, it was determined that the period of historic significance for INL ranged from 1942 with the establishment of the U.S. Navy’s ordnance testing program to the end of reactor testing as a primary INL mission in 1970. Due to their continued testing missions, the post-1970 LOFT and PBF reactor programs are exceptions. With completion of the draft INL historic contexts and building inventory and assessments, it became apparent that INL is a historic property through its association with events related to World War II, nuclear reactor testing and development, and workmanship and design of reactor equipment and associated structures. Considering INL as a historic property, as defined by INL boundaries, provides a way to organize information about INL history. (The complete INL historic contexts are contained in Appendix F.) For further information regarding the contexts, methodology, and DOE-ID building inventory see “The Idaho National Environmental and Engineering Laboratory: A Historical Context and Assessment, Narrative, and Inventory” (INEEL/EXT-97-01021 1998, revised 2003).

Within the contextual framework, of the 516 buildings surveyed in 1997, approximately 200 were determined to be eligible for the National Register. The survey and inventory were updated in 2003 to reflect changes that have occurred since 1997. For example, since the survey was completed, some of the

buildings have been demolished (e.g., those at the former Security Training Facility) and others (e.g., the CF-603 medical dispensary) have been found to be ineligible due to extensive modifications that took place after the INL historic period of significance (1942 to 1970). Some post-1970 buildings were found to be eligible due to their exceptional significance (e.g., PBF and LOFT reactors), and others were reassessed because the historic context(s) for them had been more fully developed. Table 3 provides a summary of the 2003 results, including the total number of buildings surveyed and their eligibility to the National Register (INEEL/EXT-96-01021, “The INEEL: A Historical Context and Assessment, Narrative, and Inventory”).

Table 3. Summary of DOE-ID building survey and assessment.

Area	Total buildings	Eligible
Test Reactor Area	76	59
Idaho Nuclear Technology and Engineering Center	130	23
Sitewide	23	5
Experimental Breeder Reactor I	2	2
Power Burst Facility	22	12
Test Area North	58	27
Central Facilities Area	74	39
Radioactive Waste Management Complex	48	0
Howe Peak	0	0
Total	433	160

Appendix I contains a complete list of surveyed properties by area, including:

- Year built
- Eligibility to the National Register
- Historical context
- Idaho SHPO concurrence with the eligibility determination
- Section 106 status, if appropriate
- Property type
- Present condition
- Proposed disposition
- Owner.

Those properties owned by Environmental Management (EM) are scheduled for eventual demolition. However, they may be removed from the list in the event a reuse for them is identified. Those properties owned by Nuclear Energy (NE) have been transferred from EM and the DD&D list and are continuing in use.

## Property Categories

At INL, processes are in place to protect the integrity of historical properties from activities that could adversely impact a property’s eligibility for listing on the National Register. Additionally, the historic

property management approach includes property categories under which architectural properties might be considered eligible for listing on the National Register. The four architectural property categories are:

1. **Signature Properties.** “Signature properties” is a term coined by DOE-HQ that denotes its most historically important properties across the complex (e.g., MTR) and/or those properties that are viewed as having tourism potential (e.g., World War II structures). These properties will be documented through HABS/HAER reports regardless of their ultimate disposition. A list of INL signature properties appears in Table 4.
2. **Category 1 Properties.** Key individual INL properties (reactor buildings such as ETR) that, through periodic reviews, could be reclassified as signature properties.
3. **Category 2 Properties.** Contributing INL properties directly associated with signature or key individual properties (control buildings, hot shops, and artifacts such as the TAN shielded locomotive).
4. **Category 3 Properties.** Contributing INL properties not directly associated with signature or key individual properties (e.g., cafeterias and warehouses).

As conditions change and new information is obtained, individual properties within each category may be reevaluated and reassigned to more applicable categories.

Table 4. INL signature properties.

INL Signature Properties	
INL signature facilities considered nationally, regionally, and locally significant	
EBR-I reactor building, annex (EBR-601), and guardhouse (EBR-602)	
HTRE engines on display at EBR-I (HTRE 2 and 3)	
Chemical processing building (CPP-601)	
Loss of Fluid Test facility (TAN-630 and TAN-650)	
Materials Test Reactor (TRA-603)	
TAN hangar (TAN-629)	
TAN hot shop (TAN-607)	
INL signature facilities considered locally and regionally significant (CFA World War II buildings)	
CF-606 Marine barracks	
CF-607 commanding officer’s house and CF-632 commanding officer’s garage	
CF-613 officers’ quarters	
CF-633 proofing area, which includes the containment wall, gun emplacements, and gantry crane	
CF-642 and CF-651 pumphouses	

## POLICIES AND PROCEDURES FOR MANAGING HISTORIC ARCHITECTURAL PROPERTIES

### Personnel

All work described in this section will be conducted, or closely overseen, by persons who meet the professional qualifications for such work as described in the Introduction Section of this plan and in Appendix C (36 CFR 61, “Professional Qualification Standards,” 1983).

---

As with archaeological investigations, the INL CRM Office staff has completed most of the INL historic architectural property investigations, particularly those conducted in advance of projects. However, DOE-ID and the INL CRM Office recognize that specialized skills (e.g., archival identification and maintenance and building material conservation) will be required and that no one person has all the necessary skills. To that end, much work has also been completed by subcontractors, and future architectural investigative work may require present INL CRM Office staff to gain new skills or acquire additional staff.

Outside agencies, subcontractors, and individuals completing historic architectural property investigations or research at INL are required to provide evidence of their professional qualifications and demonstrated expertise in their field. In addition, due to the nature of work conducted at INL over the years, a security clearance may also be required, as well as training regarding unique INL requirements and general legal compliance. A permitting system is presently being developed and, when implemented, will outline these and other requirements.

## **Identification**

Identification is the process of researching, locating, and recording historic architectural properties under DOE-ID jurisdiction at INL for long-term planning needs and in advance of INL projects.

### **Literature and Records Review**

The first step in the identification process is to search the CRM Office archives to determine whether the area in question has ever been surveyed for historic architectural properties, whether such properties have been found, and whether these properties have been formally evaluated for or listed on the National Register. If it is determined that a property has not been previously surveyed or evaluated, information will be gathered from technical reports, popular publications, interviews with current and former employees, and any other sources that might assist in the identification process.

### **Surveys**

The second step in the identification process is to conduct a survey. Surveys include the completion of an Idaho Historic Sites Inventory form, which has been adapted for DOE-ID properties to include information such as building size and typology (see Figure 32 at end of this appendix). In addition, 35-mm black-and-white photographs of the property will be taken. Copies of interviews, literature searches, and surveys, including survey forms and photographs, are maintained in the INL CRM Office.

## **Evaluation Process**

Once an architectural property has been identified, the following three-step evaluation process will be followed to determine its historic significance:

1. Collect data on the property to determine its physical integrity, age, and characteristics (with reference to historic contexts, property category, and role within the INL historic landscape). The collection of data for evaluation of architectural properties involves a site inspection and archival research to establish the property's association with historic events, scientific achievements, patterns of history, and architectural design or engineering characteristics. Potential sources of information reside in DOE-HQ archives, INL archives (such as those located in the technical library, CRM Office, photography laboratory, document and records centers, Public Relations, and engineering drawings), and with past and present employees.

- 
2. Identify the appropriate historical context using the characteristics ascertained through Step 1. If there is no previously identified historic context, new ones may be defined, their values identified, and the specific characteristics or data requirements outlined and added to the historic context.
  3. Compare the characteristics and integrity of the property with integrity and data requirements of the property category. If the comparison is favorable, the property meets the criteria for the National Register. If the comparison is negative, the property fails to meet the criteria.

## **Nomination to the National Register of Historic Places**

To date, the first INL reactor, EBR-I, is the only INL property formally nominated to and listed on the National Register. Nominations of other eligible INL architectural properties will be made for those that will be retained and preserved, and will be made on standard forms provided for that purpose by the National Park Service. When DOE-ID or any other interested party nominates a property to the National Register, DOE will submit the nomination to their agency official and the Keeper of the National Register for processing. As a courtesy, it can also be submitted to the Idaho SHPO.

## **Collection and Storage of Artifacts**

Artifacts from the INL World War II heritage and pioneering nuclear era exist across INL. Teams comprised of cultural resource specialists and persons with specific knowledge of INL historic events conduct walkthroughs of buildings and facility areas to identify artifacts for retention and/or collection. Artifacts are tagged for transport to an interim storage facility and tracked through the INL CRM Office database. DOE-ID intends that the artifacts be generally used in interpretive displays to educate the public about INL history and science. Displays will be comprised of both permanent INL exhibits at the EBR-I Visitors Center and traveling displays to other interpretive centers and museums. Some artifacts will be considered for preservation-in-place due to their size and/or DOE-ID's desire to retain and interpret them in their original setting.

A permanent curation facility for post-1942 INL artifacts has not been identified and may never exist. However, DOE recognizes the need for such a facility, not only for INL artifacts, but for those across the DOE complex. In the meantime, an archival plan will guide the collection of historical INL documents, and a collection plan will guide the identification and collection of other World War II and nuclear era artifacts.

## **Reuse of Historic Architectural Properties**

Whenever feasible, DOE-ID will reuse INL building, structures, and equipment. Such reuse is guided by internal management control procedures that provide processes for transferring properties from one INL project or program to another; screening to determine interest in reusing properties by other DOE facilities, other federal agencies, and private business; and ensuring that historic significance and features of properties are taken into consideration prior to activities that may affect them. The procedures for internal and external reuse are summarized in Appendix A and include:

- MCP-2680, "Building/Facility Transition"
- MCP-2477, "Utilization and Disposal of Real Property"
- MCP-3480, "Environmental Instructions for Facilities, Processes, Materials, and Equipment."

In addition to internal procedures, INL infrastructure personnel maintain a comprehensive facilities database. Project personnel use the database extensively to determine surveillance and maintenance



---

schedules, identify available floor space, and determine those properties that have reuse potential. The database includes extensive information such as:

- Year built
- Square footage
- Condition
- Planned disposition
- Cost of maintenance
- Date of deactivation and vacancy, is applicable.

Information regarding INL cultural resources is now included in the *INL Comprehensive Facility and Land Use Plan*, an interactive database that provides an overview of INL, information about land acquisition and management, information about current and future INL programs and projects, planning forecasts for each area of INL, and detailed information about INL facilities (INL 2005). This information assists personnel such as project managers in their decisions regarding reuse of historic architectural properties.

When a building or structure is determined to be a candidate for reuse, its architectural significance and historic features are considered prior to any alterations that may be proposed. Such consideration is completed by the CRM Office through the cultural resource review process. When feasible, the secretary of Interior's Standards for Rehabilitation will be followed during the alteration process and, in the interim and when a building is vacated, the secretary of Interior's guidelines for mothballing historic properties will be followed.

## **Tailored Section 106 Project Review**

In the past, when INL historic architectural properties were threatened by projects, DOE-ID followed the review process outlined in NHPA Section 106 on a property-by-property, project-by-project basis. This proved cumbersome and had the potential to result in costly project delays. Therefore, one of the main purposes of this plan is to tailor the Section 106 process to meet INL needs.

The INL-specific process known as a cultural resource review is initiated early in project planning and by either contacting CRM Office staff directly or, if required by internal company procedures, via the INL NEPA compliance process. However, a word of caution is required. Although NEPA and the NHPA have similar goals, obligations of federal agencies to NHPA are independent from NEPA. The NHPA obligations must be met during INL activities, even those that do not require the completion of a NEPA checklist, EA, or EIS. Proposed projects that are not considered to be major actions with significant impacts must still consider the potential for direct, indirect, and cumulative effects on historic INL architectural properties. Also, NEPA categorical exclusions obtained for certain projects, such as those related to environmental cleanup, do not relieve federal agencies of their responsibilities as outlined in the NHPA. The NHPA is not superseded, and procedures to protect and mitigate cultural resources must be applied. In situations where both NEPA and NHPA apply, DOE-ID may choose to substitute NEPA for the NHPA 106 process. If this is the case, DOE-ID will notify the Idaho SHPO and Advisory Council in advance of each project that will be managed in this fashion [36 CFR 800 (c) 8]. "Standards for Developing Environmental Documents to Comply with Section 106" [36 CFR 800.8 (c) 1] will be applied to such environmental documentation.



---

## Cultural Resource Review Exemptions

INL contains various property types that are elements of, or have features that contribute to, the overall landscape and understanding of INL history. However, due to the dynamic nature of the work conducted at INL and the fact that it is a functioning science and engineering laboratory, some INL property types do not meet National Register criteria. While these properties may contribute to the overall landscape under different historic contexts, they are not likely to yield additional information important to understanding those landscapes and are, therefore, exempt from consideration as potential historic properties.

In addition to exempt property types, some routine INL activities do not typically pose a threat to architectural properties or artifacts. Projects that involve activities on this list are also exempt from the review process. The exempt property types and activities, enumerated in Tables 1 and 2 of this plan, have been reviewed and approved by the Idaho SHPO, Advisory Council, Shoshone-Bannock Tribes, and INL CRM Office professionals. Additions of property or activity types proposed for inclusion on these lists will require similar review and approval (SHPO letter May 22, 2003). Due to its status as a National Historic Landmark, for activities proposed at EBR-I, DOE-ID will follow 36 FR 800.10.

## Cultural Resource Review Process

Caution is exercised during INL project planning to ensure that no historic architectural properties are inadvertently destroyed, transferred, sold, or altered. This requirement is met through the following internal cultural property review process.

**Initiating a Review.** All work at INL is guided and controlled by various internal standards and procedures, such as:

- STD-101, “Integrated Work Control Process”
- MCP-3562, “Hazard Analysis and Control of Operational Activities”
- MCP-3571, “Independent Hazard Review”
- MCP-3480, “Environmental Instructions for Facilities, Processes, Materials, and Equipment.”

Compliance with these standards and procedures will require managers working on projects that may affect architectural properties to screen their projects against the exempt property types and activities lists (see Tables 1 and 2 in the “Idaho National Laboratory Cultural Resource Management” Section) and/or complete a NEPA environmental checklist. If it is determined that the project activities are not exempt and may affect a property that is not exempt, the project manager or designee will contact the INL CRM Office to initiate a review. INL CRM Office personnel will determine the area of potential effect, the potential for impact to a historic property by the project, and whether or not that impact will be adverse.

**Obtaining Required Information.** To initiate and facilitate the review process, at a minimum, the project manager will provide to the INL CRM Office a succinct statement of the work to be performed, which will describe the project, its location, size, and scheduled start and finish dates; the identity of the performing organization and point of contact; and funding to conduct the review. For large or complex projects, additional information may also be requested.

**Timing of Reviews.** Review requests are to be made to the INL CRM Office early in the project planning process. At least 30 days are to be allowed for completion of the INL CRM Office review. If the INL CRM Office determines that the eligibility and effect findings require Idaho SHPO and/or Advisory Council consultation, additional time will be required to draft a formal letter of consultation and to gather documentation that will aid in the consultation review process. After consulting parties have received

---

sufficient information, they will have 30 days to review the project. On rare occasions, additional 30-day review periods may be necessary depending on timing and the complexity of the project.

## Effect Determinations

Briefly, after compiling and reviewing appropriate documentation as previously discussed, the INL CRM Office will determine if the proposed project will impact historic architectural properties. Three possible effect determinations exist:

1. **No Historic architectural properties affected.** No historic architectural properties exist within the area of potential effect; or historic architectural properties are present, but the proposed undertaking will have no effect on the characteristics that make the properties culturally important. In this case, the project may proceed as planned.
2. **No adverse effect.** Potentially eligible architectural properties are present in the area of potential effect, the undertaking is not exempt and will affect the historic properties, but the effect is or can be rendered not adverse. The INL CRM Office will work with project managers or their designees to ensure, or to develop strategies to ensure, that project activities will not be harmful to the historic property. When appropriate and if possible, project work plans will be written or adjusted to incorporate applicable avoidance and protective measures that render a potentially adverse effect harmless. Discussion regarding methods used to redesign projects or to turn anticipated adverse effects into no adverse effects will be documented, retained in the INL CRM Office, and summarized in annual reports.
3. **Adverse Effect.** The project activities are not exempt and will result in damage to one or more historic architectural properties. According to 36 CFR 800, "Protection of Historic Properties," an undertaking has an effect on a historic property when the undertaking may alter the characteristics of the property that may qualify the property for the National Register. The effect is considered to be adverse if it may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association in any of the following ways:
  - Destruction, damage, or alteration of all or part of the property
  - Isolation of the property from or alteration of the character of the property's setting when that characteristic contributes to the property's eligibility
  - Introduction of visual, audible, or atmospheric elements out of character with the property or the setting
  - Neglect of a property resulting in deterioration or destruction
  - Transfer, sale, or lease of the property without protective covenants.

In the event that adverse impacts cannot be avoided, DOE-ID will consult with the Idaho SHPO and interested parties to develop measures to minimize or mitigate the impact.

## Mitigation

When an effect on a historic architectural property will be adverse and avoidance or reuse is infeasible, mitigation to minimize the adverse effect will be necessary. Based on the relative importance of the affected property, as defined by the property category, mitigation includes varying types of documentation based on its relative significance. EBR-I is exempt from this process due to its status as a National Historic Landmark.

---

In the event a project is proposed that will substantially alter or demolish it, DOE-ID will follow the provisions outlined in 36 CFR 800. For all other DOE-ID-owned buildings surveyed to date, mitigative recordation will be conducted as follows:

- **Signature Properties.** DOE-ID will follow 36 CFR 800.3 through 800.7. In addition, the DOE-HQ chief historian will become a consulting party and a signatory to any agreements that may develop. Serious consideration will be given to preservation in place.
- **Category 1 Properties.** If an architectural property housed a reactor or a significant process (e.g., ETR at RTC or the Fuel Processing Building at INTEC), was constructed during the defined period of significance (1942 to 1970), or is determined to have exceptional importance, that architectural property will form the primary property in a HABS/HAER study. The primary facility and its historic features will be thoroughly documented to HABS/HAER Level II standards. The complex of buildings, structures, and objects directly supporting the primary facility or process will be incorporated into the HABS/HAER study (HABS/HAER Collections 1983). A single HABS/HAER document might include several Category 1 structures (e.g., the TAN hangar).
- **Category 2 Properties.** If an architectural property is an integral component in the reactor or process complex (e.g., cooling tower, heat exchanger, or reactor coolant pump house), its interior, when possible, and exterior will be photographed with large-format, archivally processed, black-and-white film. Photographs will include one photograph of each side of the building or structure, oblique photographs showing the relationship of the building or structure to associated buildings or structures, and interior photographs that illustrate historic features. The photographs will be preserved along with architectural and engineering drawings that depict elevations, sections, details, and historic features; and with available historic photographs of construction, manufacture, and other activities or experiments. When a HABS/HAER study is required for the key building or structure in a complex, these photographs and other documents will become part of the study.
- **Category 3 Properties.** If an architectural property such as a guardhouse, cafeteria, or warehouse was contributing, but was not directly related to the key building or process, it will be documented with 35-mm black-and-white reconnaissance-level photographs and the completion of an Idaho Historic Sites Inventory form. This documentation will be preserved by the INL CRM Office and made available to scholars, researchers, and other interested parties. When appropriate, some 35-mm photographs will be included in HABS/HAER reports to illustrate the narrative.

If DOE-ID fails to complete HABS/HAER documentation prior to initiating activities that may adversely impact a Category 2 or 3 historic architectural property, they will provide the Idaho SHPO with the appropriate level of documentation as previously described. Category 1 buildings will not be adversely impacted prior to approval of the appropriate HABS/HAER report by the Idaho SHPO and National Park Service.

If an undertaking is proposed that involves properties that have not been surveyed or evaluated, surveys and evaluations will be completed and, in the event that they will be adversely impacted, the mitigation methodology previously described will be used, or new methodology will be developed in consultation with the Idaho SHPO, Advisory Council, Tribes, and other stakeholders, as appropriate. The new methodology will be incorporated into this plan or a memorandum of agreement will be developed.

---

## **Responsibilities and Consultations**

The collection of data and preliminary determination of National Register eligibility are the responsibility of the INL CRM Office on behalf of DOE-ID. Consultation is initiated with the Idaho SHPO, Advisory Council (when appropriate), and other interested parties via a letter report that includes:

- Completed Idaho History Sites Inventory form
- Determination of eligibility
- 35-mm photographs
- Evaluation techniques used
- The evaluation.

When the consultation process is initiated in response to a proposed project that may result in an adverse impact to a historic architectural property, in addition to the aforementioned information, the INL CRM Office will also include:

- Determination of the effect of the proposed project on historic architectural properties
- Project description
- Description of the area of potential effect
- Strategies developed to mitigate adverse effects of the undertaking.

If, after receiving sufficient information, the Idaho SHPO does not respond within 30 days, SHPO concurrence with the INL CRM Office's preliminary determination of eligibility is assumed. In addition, if the Idaho SHPO and Advisory Council do not respond to findings of effect within 30 days of receiving sufficient information, their concurrence is also assumed. The Idaho SHPO and Advisory Council have 30 days at each step of the process where they are involved. In the event the Idaho SHPO and/or Advisory Council disagrees with DOE-ID or requests additional information, DOE-ID and Idaho SHPO will confer in an attempt to resolve the matter. If DOE-ID and Idaho SHPO still fail to agree on eligibility after discussion and collection of additional data, if needed, DOE-ID will submit a request for formal determination of eligibility to the Keeper of the National Register of Historic Places. If DOE-ID and Idaho SHPO fail to agree on effect, DOE-ID will request the views of the Advisory Council.

## **Reporting**

Cultural resource management activities conducted by the INL CRM Office for DOE-ID will be reported annually to the Idaho SHPO, Advisory Council, Shoshone-Bannock Tribes, and interested parties. The report will be completed by the end of each calendar year and form the basis for an annual meeting to be held each February, as deemed necessary.

## IDAHO HISTORIC SITES INVENTORY: INEEL HISTORICAL CONTEXT

Idaho State Historic Preservation Office

This form documents a building at Idaho National Engineering and Environmental Laboratory. It assesses its eligibility for the National Register of Historic Places and includes other data pursuant to a Programmatic Agreement for INEEL.

### PROPERTY DATA

\*Property Name/Area/Bldg. Number TRA Access Control Facility TRA/658  
 \*USGS Map Reference Circular Butte 3 SW Idaho  
 \*Township 3N Range 29E Section 14, SW 1/4 of NW 1/4 of SE 1/4, Boise Meridian  
 UTM: zone 12 341500 easting 4827430 northing  
 \*County Butte Acres Less than one acre City 40 miles west of Idaho Falls \*Address Idaho National Engineering and Environmental Laboratory  
 Historic Context Science/Engineering: Post-Nuclear Research  
 \*Property Type: Building \*Total # features \_\_\_\_\_  
 \*Associated bldgs./structures TRA COMPLEX  
 \*Construction Date 1987 Estimated Construction Period \_\_\_\_\_ Style No Style Plan Rectangle, 1 story, flat roof \*Condition Excellent \*Moved: Yes When \_\_\_\_\_  
 \*Materials Concrete foundation. Concrete walls. Roof is precast concrete with rubber roof membrane and gravel ballast.  
 \*Original Use Govt/Security (control) \*Current Use Govt/Security (control)

### NATIONAL REGISTER RECOMMENDATION: (check all that apply)

<input type="checkbox"/> Individually eligible	<input checked="" type="checkbox"/> Not eligible
<input type="checkbox"/> Contributing in a potential district	<input checked="" type="checkbox"/> Noncontributing
<input type="checkbox"/> Multiple property study	<input type="checkbox"/> Historical significance
<input type="checkbox"/> Significant person	<input checked="" type="checkbox"/> Historic landscape
<input type="checkbox"/> Architectural/artistic values	<input type="checkbox"/> Not evaluated

Comment \_\_\_\_\_

\*Recorded by The Arrowrock Group, Inc. \*Phone (208) 344-7371  
 \*Address 1718 North 17th Street, Boise, Idaho 83702 \*Project/Report Title Historic Context of INEEL, Toward a Programmatic Agreement Survey Report # \_\_\_\_\_ Reconnaissance ☒ Intensive ☐ \*Date Sept. 19, 1997

### FIELD NOTES/ADDITIONAL INEEL INFORMATION

Other name(s) _____	
Access restrictions due to contamination <u>yes</u>	IHSI#
Square footage of building <u>4,768</u>	
Future plans <u>Maintain</u>	
Historian's type classification <u>Security</u>	REV#
Historian's recommendation for mitigation upon finding of adverse impact: <u>This reconnaissance - level survey</u>	
	SITS#
Additional comment page attached <u>yes</u>	
Other notes: _____	

Figure 32. Example of completed Idaho Historic Sites Inventory form.





## **Appendix E**

### **Research Designs**



---



## **Appendix E**

### **Research Designs**

#### **INTRODUCTION**

This Appendix describes the research design that was originally prepared to guide large-scale archaeological inventories conducted in the mid-1980s. This research design was originally prepared and presented in Reed et al. 1987: 115-146. The INL CRM Office will prepare an update to this framework in the future.

#### **RESEARCH DESIGN**

The development of a research design is crucial to the successful completion of cultural resource management projects. Research designs provide a “frame of reference” describing the conceptual assumptions, research goals, hypotheses, methods, and operations of the researchers. Of critical importance is that research designs provide the foundation for determining the legal status of the cultural remains discovered during the project. Archaeological sites are eligible for protection and/or mitigation if they qualify for placement on the National Register of Historic Places. Sites qualify for the National Register if they have the potential for making scientific contributions to our understanding of the “life and culture of indigenous peoples.” The principal means of assessing the potential “scientific contributions” of a site is through a well developed research design (1980 addendum to the 1966 Historic Preservation Act).

The most effective research designs are those developed for ecologically bounded regions rather than for areas conforming to modern political boundaries (Fowler 1982). Physiographic features such as hydrographic basins are appropriate to define these regions because they often correlate with the economic “home range” of many prehistoric and early historic peoples (i.e., the region where most resources were obtained to sustain life on a yearly basis). Therefore, the cultural history of INL acquires meaning only when viewed in a larger context of human adaptation to the distribution and range of resources available in the entire upper Snake River Basin. The research design developed below incorporates hypotheses that have relevance not only to interpreting archaeological sites on INL but also to sites throughout the upper basin and, in some instances, to areas beyond.

It should be noted that research designs are meant to be dynamic statements that are continually updated to incorporate new discoveries and hypotheses. This research design is only the first step toward addressing the diverse potential of the sites on INL, and it should not be viewed as the final word. It is anticipated that it will be refined as more data become available to more accurately reflect the scientific significance, and therefore, the legal status of INL sites and the surrounding area.

It is generally agreed by professional archaeologists that an adequate research design should minimally contain the following elements (following Fowler 1982):

1. A description of the current understanding of the culture history and the distribution of the resource base in the area of concern
2. A description of the general theoretical approach to interpreting the place of prehistoric and historic sites in the culture history of the region
3. An outline of the general areas or domains of research interest, including specific research questions and the types of data necessary to answer those questions

- 
4. A description of the research strategies necessary to collect the data needed to answer the research questions
  5. An operations management plan that describes how the project objectives were completed.

All of the above five elements are presented in this appendix.

## **Theoretical Orientation**

Cultural materialism (Harris 1979) provides the theoretical framework for the approach taken to interpret the archaeological sites recorded at INL and surrounding region. Both explicit and implicit in the theory are five assumptions that form the framework of the approach:

1. Cultural systems consist of numerous interrelated parts or subsystems such as technology, social organization, and ideology; and changes in one system cause changes in the others in predictable ways
2. Culture is an energy-transforming system of objects and behaviors that draws all of its raw materials and energies from the natural environment via technology; therefore, technology is viewed as the “prime mover” of culture
3. A great deal of cultural behavior is oriented toward energy and raw material acquisition, and most of the archaeological record results from this interaction of culture (via technology) with the natural environment at particular behavioral loci resulting in debris that directly reflect those technological activities
4. When stress is experienced by a culture (e.g., when the acquisition of resources becomes overly difficult due to population pressure or environmental change), that culture will respond by intensifying production (i.e., technological development) and/or by migration to areas where the existing technology is sufficient
5. The spatial and contextual patterns exhibited by the archaeological record reflect the settlement and technological behavior of the culture.

These assumptions outline a theory relating human culture, material remains, and environment. An important implication is that archaeologists should be able to directly interpret subsistence and technological activities from the archaeological record; and, as a result, should be able to indirectly define parameters of the other interrelated cultural subsystems, such as social organization and ideology.

## **Research Design Organization**

The objective of archaeological research is to answer questions about the histories, lifeways, and processes of cultural change of past and present cultures (Thomas 1979). As previously discussed, the sole reason for conducting cultural resource surveys is to mitigate the adverse effects of development projects on the research potential of archaeological sites or regions; in other words, those sites that appear to have the potential for answering questions about history, lifeway, or process are mandated by law to be preserved or subjected to scientific excavation prior to disturbance. Those questions, therefore, must be designed and organized in a clear and defensible manner; and they must be expressed so that they are answerable. Then, research procedures must be designed to effectively extract the needed information from the total body of observable data.

For projects conducted strictly for academic research purposes, the investigator has the distinct advantage of being able to formulate his interests first, postulate the questions, and then seek the sites or regions that have the potential for answering those questions. The research procedures, therefore, can be

---

designed to acquire the data of interest. The ideal approach is reversed for cultural resource projects, such as those at INL. The study region is defined by the project along with portions of the research procedures. Therefore, the addressable research questions are defined by the project parameters instead of by the research interest, as in academic research projects. This reversal of the ideal research approach (i.e., question formulation, research design, and data recovery) results in a situation that is awkward to control. This is so because thousands of research questions could be posited for a project area, yet the discovered archaeological sites may address few, if any. The field archaeologist must be aware of all of these questions so that potentially significant sites can be recognized, but only those questions that directly apply to the observed resources are relevant and need to be developed during the analysis and reporting stages of the project.

The remainder of this section presents research questions that are appropriate for the range of archeological sites known to exist on and around INL. The questions emerge from the overviews previously presented. It should be emphasized that a research design is more than a list of research questions; it must also outline the processes that lead to answers. One of the most difficult aspects of research design formulation is stating questions so that they can be answered. This often leads to questions that appear mundane and of little importance, yet they are crucial for addressing the broader objectives of archaeological research. In response to this, a hierarchical organization of questions and interests has been proposed (Fowler et al. 1981) as an appropriate organization for regional research designs. The organization has been successfully incorporated in several large-scale cultural resource surveys in the Desert West (e.g., Janetski 1981; Janetski and Holmer 1982). The approach organizes research objectives and questions according to the following outline:

Problem Domains

    Research Topics

        Research Questions

            Data Requirements

Several research topics might be presented under each domain, and several questions under each topic.

## **Problem Domains**

Problem domains are general categories of research topics that embody all of the objectives of archaeological research: the who, what, where, when, and why of past cultures. The domains currently developed for INL are:

- Chronology
- Settlement and subsistence
- Cultural relationships
- Demography
- Environment
- Technology
- Material culture data recovery techniques.

There are undoubtedly others that can and will be added, but it is felt that most questions currently being asked of the archeological record in the upper Snake River Basin fall under one of the aforementioned domains.

---

The problem domain of chronology subsumes questions that address when archaeologically defined cultures existed and how archaeologists recognize those cultures from their material remains. Settlement and subsistence subsumes questions about settlement patterns and economy; demography about population density and distribution; and technology about manufacturing, processing, and resource acquisition techniques. Since cultures do not develop in a vacuum, the problem domains of environment and cultural relationships deal with the physical and cultural surroundings with which groups interacted. New techniques are continually being developed for analyzing archaeological data that are addressed by the problem domain of data recovery techniques.

## **Research Topics**

Subsumed under each problem domain are several research topics that specify an aspect that is of research interest. For example, inquiries about projectile points and ceramics suggest two topics under chronology (and, perhaps also under technology, material culture, and cultural relationships). Research topics are general statements of overriding problems and are not specific to a time or place. Using the example of projectile points, one topic under chronology should address the temporal meaning of projectile point styles in the upper Snake River Basin. This topic would be accompanied by background information briefly describing the history of research into this aspect of chronology with a summary of what we now know.

## **Research Questions**

Under each research topic are questions to be answered by investigating the archaeological record. These questions must embody specific hypotheses and must be carefully stated so that they can be answered. Using the example of projectile point chronology, we are interested in knowing if the chronology, as interpreted for the Bonneville Basin, applies to the upper Snake River Basin; or if there is a sequence of styles that more closely resembles the northern Rocky Mountains, the central Great Basin, or the northern plains. This overall interest would be developed in the background discussion accompanying the research topic of projectile point chronology. In order to satisfy this interest, we might wish to discover a well stratified and deep cave site in the middle of the basin. However, such a site is not absolutely necessary because many, less impressive sites combined might contain adequate information to address the larger interest, or taken singly, to address an aspect of the larger interest. Therefore, the questions should be as narrow and specific as possible; they should not be stated as, "What is the chronology of the basin?" but as a series of questions specific to a projectile point type and time frame. For example, "Do Elko Corner-Notched points in the basin date to 3300 to 1000 B.P. as they do in the central Great Basin and northern Rocky Mountains, or to 7800 to 900 B.P. as they do in the eastern Great Basin?" This question simply requires a yes or no answer to each of its parts. This question would be followed by similarly phrased questions about other point styles; all questions collectively address the research topic of regional projectile point chronology.

## **Data Requirements**

Each question is followed by the data requirements needed to successfully formulate an answer and specific guidelines on how to recognize sites that potentially contain the data. What is more important is that instructions must be provided that indicate how the data fit together to answer the question. This element is the heart of any research design; it is the bridge between the archeological record and knowledge.

Returning to the Elko point chronology example, the data requirements should specify a site with the potential for being of Archaic age and containing sealed deposits with datable materials. Guidelines for recognizing such a site would include seeking out rockshelters or lava tubes containing deposits with

---

diagnostic Archaic projectile points or open sites with geological evidence of aggrading deposits. A test excavation would be justified to establish the real potential for answering the question.

## **INL Research Design**

Each of the problem domains presented thus far can potentially be addressed by the archaeological data recovered during the surveys. Interpretations concerning the potential contribution of the recovered data and recommendations about how that potential can be realized are presented later in this appendix. The research design, as presented in this appendix, is also suitable for evaluating the potential research contributions and, therefore, the legal status of previously recorded INL sites. However, it must be reemphasized that the design is far from complete and is meant primarily to address the range of data recorded during the surveys conducted by the Swanson/Crabtree Anthropological Research Laboratory (Reed et al. 1997).

### **Problem Domain: Chronology**

Determining the chronological meaning of different styles of stone tools, ceramics, and other artifacts is a critical step toward the interpretation of the prehistory of an area. Only through a detailed understanding of the artifact chronology can the antiquity of most archaeological sites be estimated. Without knowing the age of occupation of sites, little else can be learned about the other problem domains. For this reason, chronology is the most basic of the domains and has the most immediate priority.

There have been several excavations in the upper Snake River Basin that have contributed to our understanding of artifact chronology; however, most were completed before modern approaches to the analysis of style were developed. Reanalysis of those collections along with the collection of new specimens in a controlled manner is essential. Several INL sites could make significant contributions and, therefore, are protected by law.

**Research Topic: Projectile Point Chronology.** A generalized projectile point sequence has been proposed for the upper Snake River Basin based on previously excavated sites (Butler 1978); however, a more recent interpretation of the existing data proposes a much tighter sequence of styles based on comparisons with sequences developed for surrounding regions (Holmer 1986). Whereas the “tighter” sequence seems more desirable because it allows more precise age determinations of sites to be made, it is difficult to determine its validity because of the sparse nature of the existing data. It is only through meticulous data collection from the kinds of sites that exist at INL that our knowledge of projectile point sequence can be refined to the point that it is useful for answering basic questions in other domains.

**Research Question—**What is the age of the stemmed-indent base point in the study area?

The age of stemmed-indent base points has been an enigma for several decades of archaeology in the Desert West. Arguments in the literature debate about an early occurrence (8300 to 6200 B.P.) vs. a late occurrence (5000 to 3300 B.P.) in various regions. Recently, Holmer (1986) concluded that stemmed-indent base points occur during both time periods (some regions contain points from only one period, and some both) and that the points of each period are not related to each other but were independently developed styles. He suggests that points of both periods are present in the upper Snake River Basin and that they should be distinguishable from each other by making a few key measurements based on a computerized comparison of the early and late series in other areas of the Desert West. Such a project has not yet been conducted in southern Idaho because of the paucity of well-dated specimens. Since numerous stemmed-indent base points occur at INL, sites containing them are especially important to determine if both early and late varieties occur there and how to tell the difference between the two.

---

**Data Requirements:** Any site containing stemmed-indented base points that also has the potential for buried deposits and datable materials.

**Research Question—**What is the age of other stemmed points in the study area?

There are numerous other styles of stemmed point styles reported to have been found in southern Idaho (e.g., Haskett, Birch Creek, Silver Lake, Alberta, and Scottsbluff points). Many of these styles are believed to have been made during the Pleistocene-Holocene transition, while some clearly date much later. Some researchers (e.g., Bryan 1980) argue that some varieties of stemmed points date as early as or earlier than fluted points (11,000 to 10,000 B.P.) and others sustain until 5000 B.P. or even more recently. Some characteristics seem to segregate the earlier from the later varieties (e.g., basal grinding), but only well-dated examples will provide the answer. Several stemmed points have been recovered from INL, and there seems to be great potential for understanding their temporal meaning through careful research.

**Data Requirements:** Any site with stemmed points especially if there is some potential for dating the age of manufacture (e.g., firehearth).

**Research Question—**What is the age of the large side-notched point in the study area?

Of all of the point styles common to the upper Snake River Basin, the temporal meaning of certain varieties of large side-notched points (e.g., Northern or Bitterroot Side-Notched points) is probably the best understood (7300 to 4400 B.P.). Other varieties, however, are not so well documented. Those specimens that exhibit a very low notch, such as the Besant and Blue Dome styles, appear to date to a later period (1300 to 3300 B.P.); however, this conclusion awaits further well-controlled data. Numerous points of the low-notch variety have been recovered from INL, and the area clearly has potential to understand their temporal similarities and differences with the high-notch variety.

**Data Requirements:** Any site with large side-notched points, especially with a potential for a datable context.

**Research Question—**What is the age of the large corner-notched point in the study area?

Large corner-notched points, known as Elko corner-notched in the Great Basin and as Pelican Lake in the northern plains, commonly occur in contexts dating between 1000 and 3300 years ago over vast areas west of the Mississippi River. Earlier, yet morphologically indistinguishable varieties occur in some areas of the Desert West (e.g., the Bonneville Basin) as early as 8000 B.P. In the upper Snake River Basin, a few specimens have been found in a pre-3300 B.P. context, but the majority seems to occur after that time. The presence of a few specimens in the early context suggests that the longer sequence of the Bonneville Basin might be applicable to INL, yet their paucity in contexts dating earlier than 4000 B.P. may indicate that excavation error or stratigraphic mixing might be the culprit. Since large corner-notched points are the most common style of point found at INL, it is imperative that additional data about their age be collected.

**Data Requirements:** Any site with datable material that contains large corner-notched points.

**Research Question—**What is the age of the small corner-notched point in the study area?

Throughout the American West, the replacement of large corner-notched points by small corner-notched points (locally called Rose Spring Corner-Notched points) in the archaeological record signifies the adoption of the bow and arrow replacing the atlatl and dart as the principal hunting technology. This appears to have occurred in the upper Snake River Basin between approximately 1500 to 1300 years ago. Although the date of introduction of the style is of interest, the termination date of use of the style is of greater importance to our understanding of the prehistory of the area. In most areas of the



---

Desert West, the small corner-notched points are replaced by small side-notched points between 1000 and 600 years ago. But the pattern in the upper Snake River Basin appears different: small corner-notched points seem to continue until historic times with small side-notched points being added to the repertoire of styles made by the more recent inhabitants. Knowing if the small corner-notched points were still being made within the last 600 to 1000 years is critical for interpreting other research questions, especially those concerning cultural relationships.

**Data Requirements:** Any site with small corner-notched points in a stable context.

**Research Question—**What is the age of the small side-notched point in the study area?

As mentioned in the previous discussion, small side-notched points begin appearing in the archaeological record of the Desert West after approximately 1000 years ago. By approximately 700 years ago, they are the most common style. Numerous small side-notched point varieties occur that seem to have different temporal and spatial meaning. Point styles include Desert Side-Notched, General and Sierra subtypes, Avonlea, Plains Side-Notched, Prairie Side-Notched, Bear River Side-Notched, Uinta Side-Notched, and Nawthis Side-Notched. These different varieties have been only recently been recognized and most have been recovered during surveys at INL.

**Data Requirements:** Any site with small side-notched points in a datable text.

**Research Topic: Ceramic Chronology.** The time depth of ceramic manufacture in the upper Snake River Basin is poorly understood. Like projectile points, there are different styles and manufacturing techniques evident in the ceramics of the upper Snake River Basin that probably have temporal meaning. Three basic styles or types are present:

1. Well-made, thin-walled small globular coiled vessel with limited incised decoration around the rim and occasionally the handles
2. Crudely made medium-sized paddle and anvil globular or conical vessel
3. Crudely made molded and coiled flat-bottomed vessel.

All of these ceramic styles appear to date to within the last 1300 years.

**Research Question—**What are the dates associated with the manufacture and use of the well-made globular vessels in the study area?

Current evidence suggests that this variety of ceramics was the first made in the upper Snake River Basin beginning sometime shortly before 700 A.D. (anno Domini [in the year of the Lord]). This style appears to be technologically related to the pottery technology practiced throughout the Southwest U.S. between approximately 500 and 1300 A.D. The local specimens may well be the northern-most example of this technological tradition. Of particular interest is that the manufacture of well-made globular vessels ceased in areas just south of the upper Snake River Basin by approximately 1300 A.D., but perhaps continued locally into early historic times. Knowing the date range of this style of vessel is critical to understanding many questions under other research domains.

**Data Requirements:** Any site with well-made pottery in a datable context and in association with other artifacts.

**Research Question—**What are the dates associated with the manufacture and use of the crudely made globular and conical vessels?

---

It is generally interpreted that more crudely made pottery (e.g., Promontory Ware) represents the incursion of other groups into the area and date to after 1350 A.D. In many surrounding areas, this style and the crudely made flat-bottomed vessels (see next research question) seem to have replaced the earlier well-made vessels. This does not seem to be the case in the upper Snake River Basin where both occur in a post-1350 context.

**Data Requirements:** Any site with crudely made globular and conical vessels in a datable context and in association with other artifacts, especially other ceramic styles.

**Research Question—**What are the dates associated with the manufacture and use of the crudely made flat-bottomed vessels?

Crudely made flat-bottomed vessels (e.g., Intermountain Ware) seem to date after 1350 A.D. and have been interpreted as a Shoshone incursion into the area. As with other crudely-made vessels in areas surrounding the upper Snake River Basin, the earlier well-made styles were replaced at that time by the flat-bottomed vessel. In the basin, however, the flat-bottomed vessels seem to show up in the archaeological record at that time, but the well-made pottery continued to be made. The apparent contemporaneity after 1350 A.D. of both types makes the prehistory of the area unique and, if true, is of critical importance to understanding the cultural history of the area.

**Data Requirements:** Any site with flat-bottomed vessels in a datable context or in the direct context with other pottery types.

### **Problem Domain: Settlement and Subsistence**

As presented thus far, if we can understand the distribution of archaeological sites (i.e., settlement) relative to the distribution of necessary resources (i.e., subsistence), we can interpret much about the lifeway of the people who left those sites behind. Our ability to accomplish this greatly depends on a detailed understanding of the cultural chronology of the area so that sites of different time periods are not lumped together in a single analysis.

The basic approach to analyzing the settlement and subsistence of a prehistoric time period has been to correlate the presence or absence of sites with existing environmental zones. With some knowledge of past climatic changes (see the environment problem domain), positive and negative correlations lead to interpretations about the importance of specific resources to the regional inhabitants during that period. To make reasonable interpretations, we must also assess the range of activities conducted at each recorded site because environmental variables would be of different importance to different activities (e.g., a fishing site would likely be in a different environmental and topographic location than an antelope hunting blind). Therefore, a settlement and subsistence analysis has three independent variables: time period, ecozone, and activity. The dependent variable in the analysis is the subsistence organization of the groups inhabiting the region at that time. Once categories or scales for each variable have been defined, the analysis becomes a simple statistical exercise; the principal problem, however, is to define meaningful categories or scales for the variables. Research oriented toward defining two of the variables is addressed under other problem domains: the time period under cultural chronology, and the ecozone under environment.

A variety of approaches to defining categories of site activities and subsistence organization have been developed. One approach used during several large-scale research projects in the Great Basin seems applicable to the upper Snake River Basin. This is because of the similar range of environments and archaeological sites based on a model of hunter-gatherer foragers and collectors (Binford 1980). Binford's field research with the Nunamiut Eskimo and his interpretation of descriptions of other known hunter-gatherer groups led him to argue that subsistence organization can be best interpreted by the

---

logistical complexity of resource acquisition. He proposed a continuum from simple to complex; the simplest involves consumers consistently moving their residences to where food is immediately available, with the most complex involving consumers only occasionally moving their residences but acquiring resources often distant from the residence and transporting them back. The simple end of the continuum, called foraging by Binford, is defined as follows:

*[Foragers] typically do not store foods but gather foods daily. They go out gathering food on an encounter basis and return to their residential bases each afternoon or evening...[T]here are apt to be basically two types of spatial context for the discard or abandonment of artifactual remains. One is in the residential base, which is...the hub of subsistence activities, the locus out of which foraging parties originate and where most processing, manufacturing, and maintenance activities take place...[and the other is] ...the location. A location is a place where extractive tasks are exclusively carried out [by the foraging party] (Binford 1980:5).*

The more complex end of the continuum, called collecting by Binford, is defined as follows:

*[Collectors] are characterized by the storage of food for at least part of the year supplying themselves with specific resources through specially organized task groups. Site implications [are] that special task groups may leave a residential [base] and establish a field camp from which food-procurement operations may be planned or executed. If such procurement activities are successful, the obtained food (taken at locations) may be field processed [at the field camp] to facilitate transport and then moved to the consumers in the residential base (Binford 1980:10).*

To summarize the difference between foragers and collectors Binford concludes that foragers move consumers to goods with frequent residential moves, while collectors move goods to consumers with generally fewer residential moves. Cultures that move goods to people (collectors) are, in Binford's terms, more logistically organized.

The terms "foraging and collecting" refer only to hunter-gatherers that move their residences at least once during the year. Entirely sedentary groups, such as agriculturalists, are even more logistically organized since the group is committed to stay near their fields and storage facilities for much of the year. Industrialized societies, such as our own, are the most logistically organized because most, if not all, of our consumption involves nonlocal resources brought to us through elaborate logistical systems.

To account for the range of logistical organizations that occurred in the Desert West during prehistoric and early historic times, Holmer (1980:133) defined harvesters as follows:

*Harvesters are characterized by the storage of foods for at least part of the year and relatively large semi-permanent to permanent residential bases tethered to a highly productive ecozone such as a marsh and/or horticultural field. Resources not associated with the focal ecozone are acquired through specially organized task groups that leave the residential base and establish a field camp from which food-procurement operations are executed. The obtained food, taken at locations, may be processed at the field camp and then transported to the residential base for storage and consumption (Holmer 1980:1331).*

Since simple agriculturalists would often be similarly "tethered" to fields as harvesters are to exceptionally productive ecozones, they should also fall under this category.

These three idealized subsistence strategies form a continuum from simple to complex. They are:

**Simple**            1)       Foragers—frequent residential moves among resource patches

- 
- |                |    |  |
|----------------|----|--|
|                | 2) | Collectors—occasional residential moves with frequent task group visits to distant resource patches  |
| <b>Complex</b> | 3) | Harvesters—permanent residential habitation near highly productive ecozones with occasional task group visits to distant resource patches. |

By constructing this continuum, it is not suggested that a particular culture can be placed at a single point along it. There is clearly a considerable amount of variability within each group. For example, a group may spend much of the year harvesting a single resource but spend the remaining time collecting a variety of resources in a variety of ecozones; or, within a single cultural group, one residential group may be more mobile (foraging) than their relatives (collecting). What is suggested is that, on average, there is an interpretable difference between cultural groups with different logistical organizations. As implied by the definitions of the idealized organizations, we would expect different relative frequencies of the various kinds of sites for each organization. A test to determine if this is reflected in the archaeological record was successfully conducted (Holmer 1981) using 6000 computer encoded sites in Utah. The data substantiated predictions about the relative difference in frequencies of residential bases, field camps, and procurement locations between Archaic hunter-gatherers and Fremont horticulturalists. Because of the success of this approach, it has been adopted to address the archaeological record of the upper Snake River Basin. Not only does this approach provide a model for interpreting the logistical organization of resource acquisition, but it also provides a meaningful site typology for use in interpreting sites at INL.

Sites are classified according to the variability in observed artifacts and features that represent the variability of behaviors and activities carried out at the site. The greater the variety of activities, the more likely it was a residential base; the fewer the variety, the more likely it was a specialized resource procurement location. Field camps fall between with some variety of represented activities, but with a clear focus on only one. Stations and caches are specialized hunting and storage sites represented by a very narrow range of activities (see Figure 33 for an illustrated theoretical organization of archaeological sites in a subsistence and settlement pattern).

This discussion must be qualified with a cautionary note regarding the limitations of using surface observations to build a functional site typology and drawing conclusions about the nature of settlement systems based on that typology. Since the assignment of a site to a particular category is based on the material array observed, any alteration of that array may result in an improper categorization. However, the fact that predicted patterns in site distributions are actually reflected in the record suggests that site burial or disturbance may add “noise” to the data, but does not obliterate the underlying pattern.

Site taxonomy is based on the amount of variability in the artifacts and features observed at each site as recorded on the site form. It is not simply the number of different kinds of artifacts, but the number of different activities implied by those artifacts. For example, several different artifact types might be used in the killing and field butchering of an antelope (e.g., projectile points, bifaces, and utilized flakes), but the site simply represents a hunting location. A similar number of artifacts could represent a field camp if more activities are implied, such as a scraper, projectile point, and ground stone. We would be especially convinced that a site containing this inventory was a field camp if there was evidence of a firebasin present (e.g., charcoal or fire-cracked rock). Of course, now the site might be confused with a residential base, but that should show an even broader range and more intense processing of raw materials.

The five site types are defined as follows:

1. Residential bases are sites that contain artifacts representative of the processing of a variety of resources (e.g., ground stone, scrapers, bifaces, and utilized flakes). They often contain evidence of dwellings, storage, and firebasins.

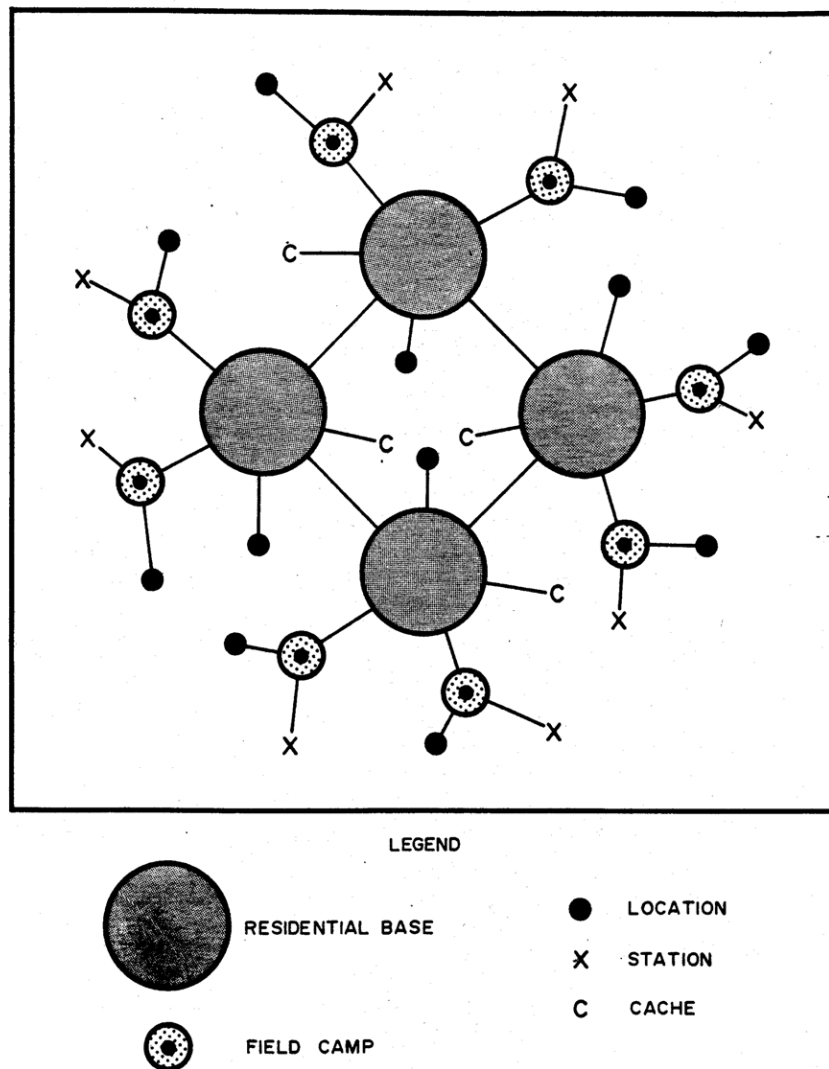


Figure 33. Theoretical organization of prehistoric archaeological sites in a subsistence and settlement pattern.

2. Field camps are sites that contain artifacts representative of the processing of a single resource often accompanied by a firebasin. They may be seed-gathering camps, hunting camps, quarrying camps, or any other single resource acquisition campsite.
3. Procurement locations are sites that contain evidence of the procurement of a single type of resource with little or no processing implied and no evidence of camping. They may be seed gathering locations, hunting locations, quarrying locations, or any other resource acquisition site. It should be mentioned that many locations (e.g., seed gathering site) may not leave physical remains behind for the archaeologist to observe.
4. Caches are isolated storage sites with little or no evidence of the processing of resources and no evidence of camping. Those storage facilities that accompany residential base sites are not classified as cache sites unless they are physically separated enough to be distinguished as a separate site.



- 
5. Stations are information gathering and transmitting sites such as vantage points, cairns, and rock art. Some debris may be present as a result of tool manufacture or maintenance, and limited evidence of camping may be present. Rock art sites (e.g., pictographs and petroglyphs) that are isolated from artifacts are classified as stations because of the implied information transmitting characteristics of the site.

A residual category of unusual sites is also necessary to include sites such as trails and canals. Even though the site types are presented in a prehistoric context, they are equally applicable to historic sites. Homesteads are residential bases, line shacks and sheep camps are field camps, agricultural fields and pastures are procurement locations, fire lookout towers are stations and grain elevators are caches.

**Research Topic: Paleo-Indian occupations.** Currently, very little is known about Paleo-Indian subsistence and settlement in the upper Snake River Basin. Fluted points are commonly found throughout the basin—as witnessed by so many private collectors owning several examples—but only a single site has been professionally excavated providing us with information about the subsistence base of the fluted-point makers. The Wasden Site (Miller 1982) suggests that the occupants of the basin, at approximately 10,500 years ago, were specialized big game hunters subsisting much like their contemporaries in the Great Plains. However, some researchers have argued that large stemmed points were also being made by occupants of the basin at that time and may represent a strategy separate in form, time, and/or space from the fluted points. Whether some stemmed points are contemporary with or later than fluted points, which is the more traditional interpretation, is yet to be satisfactorily determined. It is not until the very last cultural period of the Pleistocene that ground stone shows up in the archaeological record, indicating that the processing of plant foods was becoming an integral aspect of life on the Snake River Plain.

**Research Question—**Do fluted points always occur in large game hunting contexts or are small game and/or vegetable foods also part of Paleo-Indian subsistence.

Paleo-Indian residential base sites should contain evidence of the range of utilized food resources and of the tools needed for the harvesting and processing of those resources. Presently, we only know about the use of mammoth, but many other species of megafauna resided on the Snake River Plain that may have been utilized, as suggested by the wide variety of species recovered during the excavation of Jaguar Cave. A variety of smaller animals were also present that may have been utilized; and, plant foods should have been relatively abundant. Determining the range of resources utilized by the Pleistocene inhabitants will require the excavation of several sites.

**Data Requirements:** Any site that may have sealed subsurface deposits that occur in an area where points of this age are found. Sites that have high potential for aggrading deposits, such as in the lee of pressure ridges and in lava tubes in flows older than 10,000 years, should be considered to always have this potential.

**Research Question—**What tool types and food resources occur in association with Paleo-Indian lanceolate and stemmed points?

Paleo-Indian lanceolate and stemmed points have been associated in other parts of the Desert West with a highly specialized adaptation to the lacustrine environment surrounding late Pleistocene pluvial lakes. In the Snake River Plain, these point styles have been found in association with the remains of an extinct form of bison. Whether these point styles represent a continuation of the big game hunting tradition, a lacustrine focus, or perhaps both, in the upper Snake River Basin is not known; nor is it known if the same groups that made the fluted points for the hunting of megafauna also made stemmed points for harvesting lacustrine resources (if it turns out that they are contemporary).

---

**Data Requirements:** Any site suspected of having sealed subsurface deposits that occur in the area where point styles diagnostic of this period are known, including all of INL).

**Research Question—**Is there a direct spatial relationship between the Paleo-Indian stemmed points and extinct lacustrine systems?

This question addresses the same objective as the preceding one. If all sites associated with this tradition can be shown to be directly associated with lake shores or marshes that date to the late Pleistocene, then the argument for a specialized lacustrine adaptation gains support.

**Data Requirements:** Two types of localities are needed to address this question: (1) archaeological sites that contain diagnostic materials of this period where the surface of origin for those artifacts can be defined; and (2) selected nonarchaeological locations where extinct lacustrine features (e.g., shore lines and marshes) can be excavated for datable materials. Based on a limited number of excavations, the ages of various exposed surfaces could be determined and their spatial extent mapped. Correlating this with archaeological site distribution would either support or challenge the lacustrine specialization hypothesis.

**Research Topic: Archaic Occupations.** If the prevailing interpretation of the Archaic lifeway is valid, then the shift in adaptation at the end of the Pleistocene at about 8000 years ago should be accompanied by a broadening of the diet to include many smaller and more expensive food items (in terms of pursuit and processing time relative to caloric returns). Small game and plant foods, along with the technology to acquire and process them, should have become an integral part of the lifeway. However, there is argument (Butler 1978:68) for the continuation of a big game hunting lifeway without any perceptible broadening of the diet. This suggests that adequate numbers of big game animals continued to be available after the loss of the Pleistocene megafauna. It was not until the altithermal (7500 B.P.) that ground stone becomes a consistent element in artifact inventories. This pattern may be inaccurate because of the limited number of sites excavated from this time period; only through more excavations will we be able to interpret the relative importance of small game and plant foods to the Archaic lifeway.

**Research Question—**Do ground stone implements commonly occur in early Archaic sites?

If plant seeds were an integral part of the diet during the Archaic, then seed processing tools such as grinding stones (i.e., manos and metates) should commonly occur in seed procurement field camps and residential base sites that were occupied during the summer and fall. Several INL areas currently support dense stands of seed-producing plants, such as Indian rice grass, that were commonly eaten by the Archaic inhabitants of other areas of the Desert West. It is feasible that even if plant seeds were integrated into the diet, they may not have been harvested on INL lands because the occupants were elsewhere during the summer and fall months. Only through well designed data collection projects can this kind of question be answered.

**Data Requirements:** Any residential base site that contains artifacts diagnostic of the Early Archaic (e.g., Northern Side-Notched and Pinto series) would likely address this question. If properly excavated, the seasonality of site occupation could be determined so that the presence or absence of ground stone could be properly interpreted. Any sites other than residential bases that contain ground stone could also provide important information, especially if buried cultural material is present.

**Research Question—**Do ground stone tools commonly occur in Middle Archaic sites?

Following the discussion with the previous question, seed processing may not have been necessary during the Early Archaic; but with the onset of the altithermal, the climatic stress may have required the expansion of the diet to include such high cost resources. If this is the case, ground stone should become a



---

common element in Middle Archaic summer and fall residential bases, and there should be a noticeable increase in seed processing field camps when compared to earlier Archaic occupations.

**Data Requirements:** Any residential base site that contains artifacts diagnostic of the Middle Archaic (e.g., Gatecliff and McKean series) or any site type dating to the Middle Archaic with ground stone artifacts.

**Research Question—**Do ground stone tools commonly occur in Late Archaic sites?

With reference to the discussions above, after the altithermal (4500 B.P.), conditions should have improved in the upper Snake River Basin. Therefore, high cost items (e.g., grass seed) might no longer need to be utilized. A shift such as this would be obvious in the archaeological record and would imply a shift in subsistence organization of the area occupants.

**Data Requirements:** Any site with Late Archaic material, especially with the potential for subsurface deposits and preserved vegetal materials (e.g., a lava tube).

**Research Question—**Are there periods during the Archaic when the inhabitants were more logistically organized than at other times?

In many areas west of the Snake River Basin, semi-permanent pithouses were being constructed during some periods of the Archaic that appear to represent residence for a minimum of several months. This pattern is different than the interpreted settlement of the Archaic inhabitants of the upper Snake River Basin who apparently never stayed in one place long enough for it to be worth the energy investment to construct a substantial residence structure.

The “nature” of the food resources seems to explain the presence or absence of pithouses (i.e., more or less logistical complexity). On the middle and lower Snake River, salmon are available during certain seasons, and enough can be taken so that, with the proper storage technology, life could be maintained in one place for several months of the year. The availability of salmon, therefore, explains, in part, the presence of many of the pithouse villages along the Snake River in western Idaho. However, a few pithouse villages occur in areas where salmon are not available, such as in Surprise Valley in northeastern California. It appears that a unique combination of lacustrine resources during the Late Archaic resulted in the more complex logistical organization practiced there.

The upper Snake River Basin also has a unique lacustrine environment that may have allowed a logistical complexity sufficient to result in pithouses. Numerous house pits have been observed in the upper basin, but none have ever been excavated and reported in the scientific literature. Areas around the lacustrine systems at INL may provide an excellent opportunity for determining the logistical complexity of Archaic occupants of all periods.

**Data Requirements:** Residential base sites, especially if they contain evidence of structures, which would most likely be located adjacent to permanent water sources.

**Research Topic: Late Prehistoric Occupations.** Most prehistorians currently believe that at some time during the last 1000 years the local Archaic, populations were replaced by the Numic-speaking groups that inhabited the area at historic contact (e.g., Shoshone and Bannock Tribes). This interpretation is based primarily on linguistic evidence, although many prehistorians also claim that it is substantiated by the archaeological record (Adovasio et al. 1982; Bettinger and Baumhoff 1982; Madsen 1975). Recent reinterpretations (Aikens and Witherspoon 1986) reinforce the replacement theory for much of the Desert West, arguing that Numic-speaking people were better adapted to arid conditions than their predecessors, and that the long droughts of the 13<sup>th</sup> and 14<sup>th</sup> centuries A.D. opened the door for their dominance throughout the area. Part of their adaptability involved the use of resources that were somewhat resistant

---

to variations in available moisture, such as grass seeds, nuts, and rabbits. Reliance on these wide-ranging resources means a very different level of logistical complexity and technology than their predecessors. The implications of this theory is that the pre-Numic inhabitants had a more complex logistical organization in which the residential group was tied to the riparian environment, although special task groups would often venture into other environments; while the Numic inhabitants were less dependent on the riparian environment, and the residential group commonly moved wherever resources were available throughout the various environments.

If the replacement theory is correct and the replacement occurred because of greater adaptability to arid resources, then there should be a marked difference in the relative frequencies of site types at INL and the surrounding area. It would be predicted that a greater frequency of Numic sites should be residential bases with fewer task-specific camps and procurement locations than for their predecessors, who should be represented by few residential bases and numerous camps and locations.

**Data Requirements:** All sites that contain Numic artifacts (Desert Side-Notched points and/or pottery) and all sites that contain Late Archaic artifacts (e.g., Elko series points). Sites with buried deposits that might yield subsistence information are especially important for answering this question.

**Research Topic: Protohistoric Occupations.** Prehistorians refer to the period when the aboriginal lifeway was initially influenced by nonaboriginal technology as the “protohistoric” period. Current evidence suggests that the protohistoric period began in the upper Snake River Basin in the early seventeenth century with the introduction of the horse. Approximately 200 years elapsed before the historic period began with the Lewis and Clark Expedition in 1805. During those two centuries, a dramatic shift in lifeway occurred because of increased mobility, both in distance covered and load carrying capacity. The acquisition of the horse precipitated a shift to a more complex logistical organization resulting in much larger residential bases that were quite mobile. This should be evident in the archaeological record, and many of the subtleties should be interpretable through survey and excavation at INL.

**Data Requirements:** Any site containing evidence of equestrian use (e.g., tipi rings) especially if subsurface deposits are present.

**Research Topic: Historic Indian Occupations.** Once fur trappers and immigrants traveling the Oregon Trail invaded the area, the aboriginal lifeway again dramatically changed. This culminated with their confinement on reservations. Even with reservation life, American Indians continued to harvest resources from a variety of environments throughout the upper Snake River Basin. For example, they made yearly treks through the INL area to salmon fishing areas on the Lemhi and Salmon rivers. They continue today to hunt, fish, and collect plant resources from much of their aboriginal homeland. Use of traditional resources along with commercial goods involves an increase in logistical complexity, although much of this increase was involuntary for the Shoshone-Bannock Tribes. Evidence of the historic subsistence organization is of considerable importance for developing theory about cultural change, such as when a group is thrust into the twentieth century without their consent.

**Data Requirements:** Aboriginal sites with historic artifacts (e.g., trade beads and metal or glass points) especially if undisturbed by modern agricultural or pastoral activities.

**Research Topic: Historic Euro American Occupations.** When the West was opened for white colonization in the early nineteenth century, a new level of subsistence organization based on agriculture and ranching was introduced. For the first time, residential bases such as farms or ranches were not moved seasonally, and many of the items necessary for life were acquired via technologically or economically complex systems. Irrigation, wagons, steel tools, and the Sears Roebuck catalogue provided

---

the basis for this logistically more complex lifeway. Evidence of this era occurs at INL and can provide valuable information about pioneer life.

**Research Question—**How much did these early white settlers rely on mail order for their necessities and how much was available in the local environment?

It is difficult to determine from the historic record how self-sufficient the nineteenth century settlers were. Archaeological excavations of their trash heaps and their residences can answer this question.

**Data Requirements:** Any historic site, including residential bases (e.g., homesteads), field camps (e.g., line shacks and sheep camps), and procurement locations (e.g., fields and irrigation systems).

**Research Question:** How valuable were iron and steel tools and glass containers?

People without the means to purchase replacement metal tools will repair them until there is nothing left to repair. The same can be said about glass containers; they will be used for a variety of purposes until broken. Much can be determined about the level of logistical needs by examining what is discarded by a historic group. Discarded broken tools that could have been easily prepared indicate a group more logistically organized than a group that utilizes materials until they are spent.

**Data Requirements:** Any historic site with trash dumps, especially if it is a residential base site.

### **Problem Domain: Cultural Relationships**

The upper Snake River Basin is in a unique position being located at the juncture (or overlap) of three traditionally defined culture areas: the Great Basin to the south and west, the northern plains to the east, and the American Northwest to the north and west. The upper basin has most often been combined with the Great Basin culture area because the historic American Indian groups of the Snake River Basin spoke languages related to those spoken by other Great Basin groups. However, it is clear in the archaeological record that there were periods when northern plains-related cultures occupied, or at least interacted with the inhabitants of, cultures of the Snake River Basin. Other times, artifact types clearly indicate a Great Basin affiliation. There is little, if any, current evidence for a strong relationship with the Northwest although some artifact styles, most notably fishing gear, indicate contact with that area. The nature of the northern plains, Great Basin, and Northwest relationship is of keen interest to the archaeology of the upper Snake River Basin.

**Research Topic: Early Archaic Occupations.** The Early Archaic in the upper Snake River Basin is marked by the presence of the Northern Side-Notched point. Its introduction to the area is later than in the northern plains and earlier than the in the Great Basin. Therefore, it appears that the popularity of the style began in the northern plains, moved through the Snake River Basin, and ultimately became popular in the northern and eastern Great Basin. Whether this pattern is a result of the movement of the makers themselves or of the diffusion of a technological development is not known. Also, the style, in unmodified form, persists longer in the Snake River Basin than in surrounding areas. Does this indicate that this area became a homeland for an immigrant population from the plains, or does it mean that the technology suited the occupants' needs and was maintained until their needs changed? Also during the Early Archaic, there appears to be sporadic influxes of Pinto series points, which are common at that time in the eastern and southern Great Basin. Again, does this mean movement of people or diffusion of style or technology? Only controlled excavations of sites containing these point styles will shed light on the answer.

**Research Question—**Does the assemblage of artifacts found in association with large side-notched points suggest a northern plains origin?

---

If Northern Side-Notched points, especially those found in the earliest occupations, occur in direct association with an assemblage of other tools that is essentially identical to contemporary assemblages on the northern plains, the argument for a plains origin, or at least a strong relationship, is suggested.

**Data Requirements:** Buried deposits with Northern Side-Notched points in association with other tools, especially in a cave, lava tube, or any open site suitable to have been used as a residential base.

**Research Question—**Do the artifact assemblages directly associated with Pinto series points suggest an eastern Great Basin origin?

In the eastern Great Basin, Pinto points commonly occur in direct association with ground stone tools, suggesting some reliance on plant seeds. This type of tool is noticeably absent in the Northern Side-Notched assemblages of the northern plains. Controlled excavation of sites where Pinto points are in undisturbed buried deposits should indicate if that lifeway was also practiced in the upper Snake River Basin.

**Data Requirements:** Sites containing Pinto series points in a buried context, especially if the site was used as a residential base. Caves, lava tubes, or dune areas near water might contain this information.

**Research Topic: Middle Archaic Occupations.** During the Middle Archaic, stemmed-indent base points became the dominant style of spear point in the upper Snake River Basin. At approximately the same time, similar points were made in the northern plains (e.g., McKean complex) and in the central Great Basin (e.g., Gatecliff series) suggesting that some form of communication or population movement was occurring that involved the upper Snake River Basin. Unlike the Early Archaic period, which involved the sharing of a point style among the northern plains, upper Snake River Basin, and northern and eastern Great Basin, the Middle Archaic pattern involves the northern plains, upper Snake River Basin, and northern and central Great Basin, avoiding the eastern Great Basin. The areas are comparable in size but different in form. Radiocarbon dates suggest that the predominant Middle Archaic pattern resulted from an expansion into the Desert West from the south and west, ultimately from southern California, instead of from the northern Great Plains to the north and east as suggested for the Early Archaic.

**Research Question—**Does the assemblage associated with the stemmed-indent base point remain relatively consistent across the large area described for the Middle Archaic expansion?

If a direct connection can be made between the Middle Archaic artifact assemblages in the upper Snake River Basin and surrounding regions, an argument would be made that a single culture spanned the entire area. Some variability is expected, of course, because of adaptation to the range of local resources. However, artifacts that often have stylistic elements with no functional value (e.g., beads, basketry, hafted knives, and footwear) should be maintained and reflect cultural relationships.

**Data Requirements:** Any undisturbed site containing buried Middle Archaic assemblages. Especially important sites would be those that have remained dry since occupation, such as caves, so that perishable artifacts are preserved.

**Research Topic: Late Archaic Occupations.** The pattern established during the Middle Archaic continues during the Late Archaic, although the predominant point style changes from the stemmed-indent base to the large corner-notched points. A vast area of shared technology is suggested by this pattern. Movement of people, diffusion, or a combination of the two probably accounts for this. Of importance is that the eastern Great Basin continued to be excluded and changes that occurred there are obviously independent of those in the central and northern Great Basin, upper Snake River Basin, and northern plains.

---

**Research Question—**Are the artifact assemblages common during the Middle Archaic maintained into the Late Archaic?

As previously discussed, if artifacts with distinctive stylistic elements continue to be made during the Late Archaic, the argument for population stability is supported. The explanation for the shift in spear point style would then need to be based on something other than population replacement.

**Data Requirements:** Sites with buried Late Archaic deposits, especially in a dry cave where perishables would survive.

**Research Topic: Late Prehistoric Occupations.** The recent literature discussing the late prehistoric in southern Idaho is filled with references to Fremont occupants. The Fremont were semi-sedentary groups in the eastern Great Basin that subsisted on a mixed economy of horticulture and hunting-gathering. That lifeway was never practiced in the upper Snake River Basin, therefore, by a strict definition, the Fremont did not occupy this area. It is clear from the archaeological record, however, that the Fremont did interact with the occupants of the upper Snake River Basin; it is the nature of the interaction that is open for debate. At the same time, the northern plains seem to develop a separate trajectory of development that occasionally intrudes into the upper Snake River Basin. Therefore, any late prehistoric site containing preserved information should be considered significant.

**Research Question—**Do late prehistoric sites exhibit artifact assemblages similar to Fremont?

There are several characteristic styles of artifacts associated with Fremont sites in Utah that occasionally occur in Late Archaic sites in the upper Snake River Basin. Because of the paucity of excavated sites, we do not know if this is an underlying pattern for the entire time period that suggests Fremont occupants, or, if in only a few sites, some Fremont styles were introduced by trade or limited incursions into the area by Fremont people.

**Date Requirements:** Any late prehistoric site containing buried deposits, especially in a dry cave where perishables would be preserved.

**Research Question—**Do any late prehistoric sites contain artifact assemblages similar to the Avonlea of the northern plains?

The introduction of the Avonlea point in the northern plains marks a diversion from the consistency over a large area during the Middle and Late Archaic. The Avonlea point occurs in the upper Snake River Basin, and its relationship to the contemporary Rose Spring Corner-Notched and Desert Side-Notched points is not known.

**Data Requirements:** Any site with Avonlea points, especially with buried deposits.

**Research Topic: Protohistoric Occupations.** Once the horse and other items of European origin became available to the native inhabitants of the upper Snake River Basin, the lifeway changed dramatically. Groups became much more mobile, and we might speculate that more groups came through the basin more often; therefore, greater stylistic variability in artifacts should occur.

**Research Question—**Can incursions into the upper Snake River Basin be documented by artifacts diagnostic of the Crow, Blackfoot, Nez Perce, and Flathead tribes?

**Data Requirements:** Any sites dating to the protohistoric period.

**Research Topic: Historic Euro American Occupations.** After colonizing the Great Salt Lake area, Mormon pioneers expanded into surrounding regions to exploit the available resources. Later, when



---

polygamy was determined to be unconstitutional, refugee polygamists inhabited remote regions removed from the Salt Lake area. The upper Snake River Basin was influenced by these two phenomena.

**Research Question—**What is the nature of Mormon colonization in the upper Snake River Basin?

**Data Requirements:** Any historic homestead.

### **Problem Domain: Demography**

The actual number of people living in the upper Snake River Basin during various prehistoric periods is difficult to estimate from the archaeological record. However, interpretations about relative population density and distribution are feasible, especially in areas like INL where a considerable amount of archaeological survey has been conducted. Numerous factors affect the human use of any area. During some periods, important resources may abound; while at other times, there may be nothing at all to attract people. Catastrophic events, such as volcanic activity or floods, may make some areas unusable for limited periods of time. The actual relationship between people and natural resources is covered under the subsistence and settlement problem domain, while the population density and distribution are covered here.

As of the date of the report (Reed et al. 1987) from which this appendix was derived, approximately 3% of the 586,000 acres on INL had been surveyed for archaeological resources yielding approximately 1200 sites. This suggests that there are probably more than 30,000 sites at INL that need to be considered prior to any further development. Of the known sites, 0.5% are Paleo-Indian, 2% are Early Archaic, 10% are Middle Archaic, 45% are Late Archaic, and 40% are late prehistoric. The remaining 2.5% are historic or of unknown temporal affiliation.

**Research Topic: Paleo-Indian Population Density.** A quick review of collections of projectile points from the upper Snake River Basin suggests that the area may have been more densely populated than surrounding regions during the late Pleistocene. Hundreds of fluted Clovis and Folsom points have been found, primarily by amateur collectors. We do not know if this relatively large number reflects a large number of people, a few people who made and lost large numbers of points, or a depositional environment that makes their recovery more likely.

**Research Question—**Was the INL area as heavily used during the late Pleistocene as other areas in the upper Snake River Basin?

**Data Requirements:** Any site with Paleo-Indian artifacts, especially if subsurface deposits are present.

**Research Topic: Archaic Population Density.** Throughout the upper Snake River Basin, there seems to be a dramatic increase in the number of sites that date to the Late Archaic, as interpreted by the presence of Elko corner-notched points. Does this reflect an increase in population size or, perhaps, a stable population practicing a more mobile lifeway and leaving more sites behind?

**Research Question—**Does the dramatic increase in the number of Late Archaic sites over earlier sites indicate greater population density?

Under the settlement and subsistence problem domain, Late Archaic sites are examined for a shift in subsistence organization. If it is determined that subsistence is essentially the same during that period as in previous periods, then a regional increase in population size or a concentration of regional population in the desert areas of the Snake River Basin might be an acceptable interpretation. Survey and excavation data from INL could make a significant contribution to answering this question.

---

**Data Requirements:** Any Archaic site, especially those with buried cultural deposits so that an estimate of length, occupation, and size of group can be made.

**Research Topic: Late Prehistoric Population Density.** Based on the number of known sites that date to the late prehistoric, it would appear that population size decreased in the upper Snake River Basin after the Late Archaic. As with the previous research topic, this may reflect a changing subsistence organization rather than a population decrease. INL excavation and survey data will help address this topic.

**Research Question—**Does the population of the upper Snake River Basin decrease during the late prehistoric?

The answer to this question relies heavily on the interpreted subsistence organization covered under the subsistence and settlement research domain. If group size is not increasing and if there is no shift toward greater logistical complexity, then an acceptable interpretation would be decreasing population concentration in the Snake River Basin.

**Data Requirements:** Sites with late prehistoric occupation, especially if subsurface deposits are present that may have information concerning group size and length of site occupation.

**Research Topic: Overall Site Density.** Based on the current level of survey of INL lands, there is approximately one site for every 15 acres of land. Although most of these (85%) are small sites consisting of fewer than 100 stone flakes and tools, this site density rivals culture areas like the Southwest (Arizona and New Mexico) and the Mississippi River area where complex agriculture-based cultures emerged.

**Research Question—**Why are there so many sites at INL?

An answer to this question may arise through subsistence research, but it may also be answered through demographic studies. It is feasible that there were so many people living in the upper Snake River Basin that the resources on INL had to be relied upon. It is equally feasible that the resources on INL were so desirable that they attracted heavy use of the area.

**Data Requirements:** All sites that have temporally diagnostic artifacts, especially if accompanied by subsurface deposits that may yield information concerning group size, subsistence activity, and length of stay.

**Research Topic: Volcanic Activity and Human Behavior.** Numerous volcanic events occurred in and around INL during the late Pleistocene and Holocene that should have affected human adaptation. The Great Rift area, Hells Half Acre field, Cerro Grande area, and more distant Picabo Vent complex must have diverted animals and hunters to adjoining areas, or may have even attracted both with an assortment of geothermal resources and spectacular visual effects. The effect of the flows on human demography is an especially intriguing question that could be answered through research on INL.

**Research Question—**What effect have periods of volcanic activity had on regional populations?

It is logical to conclude that volcanic activity would at least temporarily alter the human use of the effected area, and at most, permanently change the use of the area. Excavations of both pre- and post-eruption sites could provide insights into this problem.

**Data Requirements:** Especially important to answering this question would be sites that are covered by volcanic flows. Since the presence of these features would not be detectable during survey, this kind of site would only be encountered during construction activities. Most post-eruption sites are recorded during survey, and those with subsurface deposits can tell us much about the human use of the area.



---

## Problem Domain: Environment

The reconstruction of the environment is critical for interpreting human behavior. Humans usually respond adequately to climatic changes by adjusting their subsistence organization and/or technology to suit their changing needs. We know much about global climatic patterns, but little about the local effects of the constantly changing moisture and temperature cycles. Research concerning environmental reconstruction can be conducted at both archaeological sites and other sites where the proper data are preserved. Cave sites (e.g., lava tubes) with long depositional sequences are especially important because they often contain the remains of rodents and other small animals that are sensitive to climatic change. Caves also often trap pollen grains from plants growing in the area and from those brought to the site by prehistoric inhabitants. A climatic sequence based on a 2000-year cycle has been proposed (Butler 1978) based on cycles of small mammals recovered during the excavation of Owl Cave at the Wasden Site located just south of INL. In many ways, it correlates well with interpreted world climatic cycles (Denton and Karlen 1973).

Of particular interest is that projectile point styles always change during interstadials and persist through the following stadial. Theoretically, the carrying capacity of a desert area like INL should decrease during the interstadials, which were generally warmer and dryer, thus stressing the human populations who rely on the natural resources. However, our present understanding of the climatic cycle is poor at best, and if we are to make interpretations about the meaning of artifact style changes, as well as subsistence and demographic changes, we must pursue environmental data as it applies to the local situation. INL sites have a tremendous potential for contributing to this understanding.

**Research Topic: Pleistocene Environments.** We know that numerous species of animals became extinct near the end of the Pleistocene. The changing environment must have had a dramatic effect on the lifeway of people inhabiting the upper Snake River Basin. It is not known whether the adjustments that people had to make were slow, involving very slight changes over multiple generations, or were dramatic, necessitating a single generation of inhabitants to make significant shifts in the lifeway.

**Research Question—**How quickly did the Pleistocene megafauna become extinct?

**Data Requirements:** Pleistocene sites with buried cultural deposits.

**Research Topic: Holocene Environments.** Since the end of the Pleistocene the Snake River Plain has probably been much like it is now. There were wetter and dryer periods, resulting in the increase and decrease of pluvial lakes that temporarily supported animal and human populations. The history of the pluvial lakes at INL would provide a scale by which to interpret much of the habitation there. Occupation when water was not available is likely to be of a very different kind than when water was plentiful.

**Research Question—**What is the sequence of pluvial lake increase and decrease?

Some information is already known about this history, but much of the detail has not been studied. If we are to understand the human occupation of the area, we must know more about this sequence.

**Data Requirements:** Playa-edge sites, with or without cultural material, which contain datable deposits due to flooding and desiccation.

## Problem Domain: Technology and Material Culture

Aboriginal technology evolved over the 12,000+ years of occupation of the upper Snake River Basin. This is best recorded in stone tool manufacturing because stone is not perishable and the remains of all stages of stone tool manufacture are preserved. Other items in the material culture also show technological development, but most of those are perishable (e.g., basketry and clothing). Different

---

groups developed different solutions to similar problems in the manufacture of various items. INL sites have the potential for addressing several of these.

**Research Topic: Stone Tool Manufacture.** Most of the tools recovered from archaeological sites are made of stone. This is because stone is an excellent material for tool manufacture and because it is durable, outlasting the more perishable materials of wood and bone. Numerous sources of stone suitable for tools exist in and around the upper Snake River Basin; the most notable near INL is Big Southern Butte, which is a major source of obsidian that was heavily exploited by the prehistoric inhabitants of the region. Studies conducted near there can tell us much about the processes of material acquisition and stone tool manufacture.

**Research Question—**How are lithic resources acquired, reduced, and transported to the ultimate areas of use?

Sites representing primary reduction of obsidian near Big Southern Butte should tell us much about material acquisition and initial processing. Removal of the reduced material to camp or residential sites would be expected and should be evident in the archaeological record. Detailed analyses of reduction stages, along with source analyses and hydration dating, should provide a detailed history of lithic resource utilization that would be unparalleled in the archaeological literature.

**Data Requirements:** Any site with obsidian flakes that can be classified to their stage of reduction. This includes sites where lithic materials were being acquired, and those in which obsidian was being used to process other resources.

**Research Topic: Basketry Technology.** The classification of basketry has been the source of much confusion in reconstructing the prehistory of the upper Snake River Basin. It has been argued (Adovasio et al. 1982) that after 10,000 years of continuity of basketry technology during the Archaic in the eastern Great Basin and the upper Snake River Basin, it disappears from the face of the earth sometime between 1300 and 1800 A.D. Technology has always changed in response to the needs of the people, and it is feasible that basketry technology did the same. However, the apparent loss of a basketry technology in the upper Snake River Basin has not been adequately demonstrated, and some INL sites have tremendous potential for addressing this question.

**Research Question—**Is there a change in basketry technology anytime after the Pleistocene?

Apparently, the historic groups of the area employed a different basketry technology than did those inhabiting the few prehistoric cave sites that have preserved basketry remains. Any continuity, or lack thereof, is important to understanding the prehistory of the occupation of the area.

**Data Requirements:** Any site with preserved basketry remains. This would be expected only in dry cave situations, such as some of the lava tubes at INL.

### **Problem Domain: Data Recovery Techniques**

It is estimated that approximately 75% of the stone materials used for tool manufacture in the upper Snake River Basin during prehistoric times was obsidian. Obsidian sources are numerous and each has a unique “fingerprint” of constituent elements. Stone tools and waste flakes can be chemically analyzed and their source determined. In addition, obsidian is an unstable compound that is chemically altered when exposed to air and water through hydration. Therefore, once an obsidian cobble is fractured during tool manufacture, the new surface begins to hydrate, and if the hydration rate is known for that source, an age of tool manufacture can be determined. This type of analysis has a tremendous potential for unraveling the cultural history of the INL sites.

---

**Research Topic: The Sources of Obsidian Used for Stone Tools.** Determining the source of the obsidian used for stone tool manufacture can provide insights into many of the other problem domains. It is suggested (Binford 1979) that stone material is acquired while pursuing other resources, especially food. This implies that the sources of the employed stone should reflect the subsistence round (e.g., home range) of the people using those stone resources. If this is true, then determining the source of the stone materials will generate a “map” of the home range of the people utilizing those resources. Determining the source of obsidian present at INL sites would provide information about the home range of groups of all ages.

**Research Question—**What are the sources of obsidian exploited by INL occupants?

It is expected that the pattern of obsidian exploitation changed over time as subsistence patterns changed, yet this is purely conjectural and INL sites can help determine if this expectation is true. It is desirable to determine the source of obsidian from every INL site, especially those that have some temporally diagnostic artifacts such as spear or arrow points, or pottery.

**Data Requirements:** All INL sites that have obsidian artifacts.

**Research Topic: The Age of Obsidian Tool Manufacture.** Once the hydration rate is determined for a particular obsidian source, that source can be dated by measuring the thickness of the hydration rind and determining the temperature to which that the specimen has been subjected. All flakes and tools can potentially be dated to their time of manufacture. Therefore, all INL sites can potentially be dated to their time of use. If this were accomplished, dramatic advances in understanding the prehistory of the upper Snake River Basin would be achieved.

**Research Question—**Can we determine the age of obsidian tool manufacture of specimens recovered from the surface of INL sites?

Artifacts recovered from the surface need to be correlated with their subsurface counterparts to determine if the temperature variable is the same in the equation to determine age relative to the hydration thickness.

**Data Requirements:** All INL sites with obsidian artifacts, especially those with alternate dating potential (e.g., charcoal in firehearth).

## Research Design Summary

Numerous research questions are presented that address the research significance of the cultural resources observed at INL. A common element is evident in the type of site that can answer many of those questions. That element concerns buried, intact deposits, especially those in the context of datable materials (e.g., fire hearths containing charcoal). Therefore, any site that exhibits the potential for buried deposits is, by law, potentially significant and must be protected or mitigated. Limited test excavations can determine if there are buried cultural deposits and can determine the research potential, and hence, legal status, of the site.

Other sites may also be significant under the law. Those containing artifacts indicating Paleo-Indian occupation, for instance, will always require additional study before destruction. Sites dating to other time periods may be similarly significant; such as sites with stemmed points located adjacent to playas.

The determination of site significance is a complex issue that does not have a formulaic answer. Any site that can potentially answer a question of research interest is, by law, significant. All of the sites determined to be in this category must be mitigated; this may involve further collections from the site, test excavations, or complete excavation.

